THE

AMERICAN GAS-LIGHT JOURNAL

DEVOTED TO

LIGHT, WATER, AND SEWERAGE.

JOHN B. MURRAY, BANKER, NEW-YORK CITY, PROPRIETOR.

Iron Buildings, No. 254 Canal Street, East, (cor. Elm Street,) near Broadway.

FIRST YEAR.—No. 8. NEW-YORK, WEDNESDAY, FEBRUARY 1, 1860. $3 PER ANNUM.

TO GAS FITTERS AND PLUMBERS.

WROUGHT IRON GAS-PIPE HOOKS, HOWEVER small a matter for gas fitters, are often a trouble for not having them sometimes on hand when required. L. WAKEFIELD & Co., 94 Beekman street, N. Y., have always on hand several hundred kegs of all sizes, from ¼-inch to 2 inch. They are made of the best quality horse-shoe nail-iron, and are warranted not to break. They also keep constantly on hand a large assortment of all kinds of materials for PLUMBERS, such as China Wash Basins, Closet-Basins, Pan-Closets, Bath-Tubs, Boilers, Brass and Silver-plated Cocks, Brass and Iron Pumps, Hydraulic Rams, French Fountain-Jets, &c., all at the very lowest prices.

J. K. BRICK & CO.

BROOKLYN CLAY RETORT AND FIRE-BRICK Works, Van Dyke, near Van Brunt street, Brooklyn, N. Y.—J. K. BRICK & CO., manufacturers of Non-Filtrating Clay Retorts, Fire Brick, Gas and Hot House Tiles, Arch, Furnace and Cupola Brick, Fire Cement, Mortar, &c.

J. K. B. & Co., have, at their extensive works, facilities for manufacturing, which enable them to supply gas companies and others with any amount of their goods, at short notice.

Particular attention is invited to their superior Clay-Retorts, which are giving perfect and universal satisfaction to the numerous gas companies who have them in practical operation.

They refer parties interested to the Brooklyn, N. Y., Gas-Light Works, where can be seen more than two hundred in daily use.

CHECK-BOOKS FOR GAS CONSUMERS.

GAS-METER CHECK-BOOKS, ARRANGED WITH an index to record the consumption of gas for twelve months, detecting any over-charge by a gas-light company and rendering a mistake impossible. Price 25 cents each, or $15 per hundred, delivered free of postage. Postage stamps can be remitted in payment

Address Rooms of the AMERICAN GAS-LIGHT JOURNAL, New York.

LAND IN CANADA FOR GAS-LIGHT SHARES.

Town of Coburg,	Northumberland Co		14 acres.
Do Hamilton,	do	do	100 "
Do North Monaghan,	Peterborough	do	600 "
Do South do	do	do	100 "
Do Dummer,	do	do	100 "
Do Douro,	do	do	223 "
Do Haldimond,	Northumberland	do	200 "

These lands are well located, and will be exchanged on equitable terms for sound, dividend paying gas-light shares in the United States or British Provinces.

Apply or address E. R. L., Post-Office, Toronto, Canada, or at Rooms of AMERICAN GAS-LIGHT JOURNAL, New York.

H. P. GENGEMBRE'S

PATENT NON-FREEZING AND NON-EVAPORating Gas-Meter Fluid.

A meter once filled with this fluid, costing only from 10 to 15 cents per gallon, will require no further attendance; will allow any amount of gas to pass through without affecting the level of the Fluid, and will work equally well in winter or summer, however exposed it may be.

I have appointed A. L. BOGART, No. 592 Broadway, New York City, my Agent for the New England States and the State of New York; and A. DOIST, Box 1180, Cincinnati, O., my Agent for the balance of the United States; but no assignment or licenses for using my patent will be valid without being ratified and signed by myself. H. P. GENGEMBRE, Box 48, Alleghany City, Pa.

STANDARD PHOTOMETRIC CANDLES.

OWING TO THE NUMBER OF APPLICATIONS made to me for information concerning the supply of the "STANDARD SPERM CANDLE" used in Photometrics, I have obtained a supply from which I can furnish those who require them, with full directions for use.

T. W. PARMELE, No. 4 Irving Place, New York.

WATERHOUSE & BOWES,

BUILDERS OF GAS-WORKS, RALEIGH, N. C. Gas-Works erected in any part of the United States.

REFERENCES.

James H. Carson,	President	Charlotte	N. C.	Gas-Works,
D. G. Fowle,	do.	Raleigh	N. C.	do.
J. C Smythe,	do.	Salisbury	N. C.	do.
Arch. McClean,	do.	Fayetteville	N. C.	do.
Joseph A. Waddell,	do.	Staunton	Va.	do.
A. G. Story,	do.	Little Falls	N. Y.	do.
George H. Young,	Proprietor	Waverley	Miss.	do.

Wm. Johnston, President of Charlotte & S. C. R. R., Charlotte, N. C.
A. B. Wood, Agent Reading Iron Works, 57 Maiden lane, N. York.
Cornelius & Baker, Manufacturers of Gas-fixtures, Philadelphia.

G. B. WATERHOUSE. M. BOWES.

CORNELIUS & BAKER,

MANUFACTURERS OF

LAMPS, CHANDELIERS,

GAS-FIXTURES, &c.

MANUFACTORIES,

821 CHERRY STREET,

AND

FIFTH STREET AND COLUMBIA AVENUE.

STORE, 710 CHESNUT STREET,

PHILADELPHIA.

PHILADELPHIA GAS-FIXTURE WORKS.

WARNER, MISKEY & MERRILL, MANUFACturers; store No. 718 Chestnut street, Philadelphia. Warner, Peck & Co., No. 376 Broadway, N. Y., would respectfully inform the public that they continue to manufacture all kinds of Gas-Fixtures, Lamps, Girandoles, Bronzes, &c., &c., and that their large and varied stock comprises the simplest as well as the most elaborate patterns, designed by their French artists. They also continue to keep at their store, No. 376 Broadway, a large and full assortment of all their manufactured goods. Dealers and others are invited to call and examine.

F. BUTTS & CO.,

GAS-COAL DEALERS, CLEVELAND, OHIO.

THE ATTENTION OF GAS COMPANIES IS called to the following analysis of Sterling Coal, which is mined and sold exclusively by us:

CLEVELAND, May 17th, 1859.

ANALYSIS OF "STERLING COAL."

Sp. gr		1.288
Hygrometric moisture	1.85	
Volatile combustible matter	34.15	
Coke (clear and porous)	64.00	
	100	
Fixed carbon in the coke	62.00	
Ashes (yellowish white)	2.00	
	64.00	

COMPOSITION OF ASHES.

Silex	0.80
Alumina	0.45
Peroxide of iron	0.85
	2.00
Percentage of sulphur	0.28

J. L. CASSELS, M. D.,
Prof. of Chemistry, Cleveland Medical College.

P. S.—The specimen from which the above analysis was made, was taken by myself from a car load, and may be regarded as a fair average; in fact, this coal is very uniform in its charateristics. It also yielded four per cent. more gas than the Pittsburgh coal.

J. L. C.

This coal is used by the following gas-light companies, to whom reference can be made as to quality, &c.:

Manhattan Gas-light Company,	New York.		
New York	"	"	"
Albany	"	"	"
West Troy	"	"	"
Rondout	"	"	"
Elmira	"	"	"
Seneca Falls	"	"	"
Rochester	"	"	"
Albion	"	"	"
Oswego	"	"	"
Brockport	"	"	"
Cleveland	"	"	Ohio.
Toledo	"	"	"
Sandusky	"	"	"
Grand Rapids	"	"	Mich
Kalamazoo	"	"	"
Ann Arbor	"	"	"
Milwaukie	"	"	Wis.

For further information address

F. BUTTS & CO.,
Cleveland, Ohio.

MARSH'S PATENT ROSIN OR SUN-LIGHT GAS-

Works, for Private Dwellings, Hotels, Factories, Railway stations, Sugar-Houses, Towns, &c. By the peculiar construction of the Retorts, the largest amount of decomposing surface is obtained in the smallest space. 2d. Gas is manufactured from crude rosin, without the least deposit of carbonaceous matter in the retorts or pipes: thus enabling them to be operated continuously, generating rapidly the best and cheapest illuminating gas obtained from this material. ALFRED MARSH & CO.,
241 Broadway, New York.

AMERICAN GAS-COALS.

JOHN HEARN & CO., ERIE, PA.,

DEALERS IN BITUMINOUS COALS FOR GAS, Steam and House use.

We are now prepared to contract for the delivery of any quantity of our Coals at all points accessible to vessels on the NORTH-WESTERN LAKES, and also at all places on the ERIE CANAL and HUDSON RIVER, or points in the interior connected by Rail Road with the water communications mentioned.

The following are a few of the Gas-Light Companies who have used our Coals—entirely or in part—for the past ten years, which we deem a sufficient guarantee as to their quality, and to whom we would refer, viz:

Manhattan Gas-Light Co., N. Y City, Albany, N. Y., Gas-Light Co,
Troy, N. Y., Gas-Light Co., Utica, N. Y., Gas-Light Co.,
Syracuse, N. Y., Gas-Light Co., Buffalo, N. Y., Gas-Light Co.,
Rochester, N. Y., Gas-Light Co., Chicago, Ill., Gas-Light Co.

For the information of Gas-Light Companies generally, we have obtained from the Manhattan Gas-Light Co. of New York City, an analysis of the several varieties of Coal named below, from which we think an estimate of their relative value can readily be made.

	Mount Carbon Pa.	Cooper's Beaver, Pa.	Pitt'gh & Youghiogheny, or Westmor'land	South Pe'th, Newcastle Eng.
Feet of Gas per ton of 2240 lbs.	9.676	9.900	10.231	9.184
Bushels of Coke	48	42	42	53
No. of pounds	1488	1388	1480	1768
Illuminating power of Gas	12.49	15.46	13.99	12.2
Ft purified per bush. hydrate lime	3 000	3500	2500	3500
Analysis of Gas.				
Olefiant Gas	5.77		5.50	
Hydro-Carbon vapors	1.23		0.00	
Carbonic Oxyde	11.88	(*)	8.00	
Analysis of Coal.				
Volatile Matter	42.75	41.50	38.15	30.83
Fixed Carbon	55.15	52.40	56.70	67.17
Ash	2.10	6.10	5.15	2.00

(*) Analysis of Gas not given.

JOS. A. SABBATON, Esq., Engineer of the Manhattan Gas-Light Company above named, says "the coke from the Mt. Carbon Coal is clean and makes a hot fire. The coke from the Westmoreland or Pittsburgh and Youghiogheny Coal, is similar to the coke from the best Newcastle, though somewhat inferior in quality. The quantity of Gas purified by a bushel of lime, varies so much in different works, according to the amount of washing, condensation, and lime surface, that the above figures, so far as the purification is concerned, must be taken as the results obtained in the laboratory in which the examinations were conducted."

The Mount Carbon Coal, for Gas purposes, considering the yield of Gas and Coke, and on account of its being comparatively free from sulphur and all other impurities, has no superior as an American Coal. The Buffalo, N. Y., Gas-Light Company, O. G. Steel, Secretary and Superintendent, says:

"The Mount Carbon Coal, which we used last year (1858) for the first time, proved to be of excellent quality, giving a satisfactory yield of Gas and Coke, both in quantity and quality. We shall be satisfied with coal of that quality for the coming year."

The Rochester, N. Y., Gas-Light Company, George W. Parsons, Supt., who used Mt. Carbon and Beaver Coal, writes: "It affords us pleasure to say that the Coal furnished by you to our Company the last season, (1858) consisting of Beaver and Mount Carbon in nearly equal proportions, has proved in all respects as good as represented, and has given a better average yield of Gas than we have had in any previous year. The Gas is easily purified, and the quality, as well as quantity, of Coke and Gas, is equal to the product of any Coal which has been furnished us."

The Syracuse, N. Y., Gas-Light Company, L. W. Conkey, Supt., writes us, Dec. 25, 1858—"We have been making Gas for the past two or three months, of the new Coals purchased of you this last season, mixed one-third Beaver and two-thirds Mount Carbon, and must say that it is the best Coal we have had since our works first started, yielding an average of more than four feet of Gas to the pound of Coal every day in the month."

Similar testimonials could be given from other Gas establishments who have used these Coals, but these are sufficient to shew the estimate in which they are held. They have no superior for Steam or Household use. We are also prepared to contract for the delivery of Pittsburgh and Youghiogheny Coal, at low rates.

J. HEARN & CO, Erie, Pa.

J. H. BRUNDAGE & CO.,

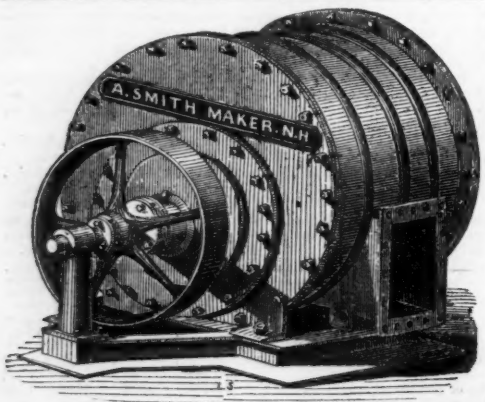
38 BURLING SLIP, NEW YORK, DEALERS IN

ROSINS ADAPTED ESPECIALLY TO GASMAKERS' USE.

N. B.—J. H. B. & CO. ARE CONSTANTLY PURCHASERS OF ROSIN-GAS TAR.

Office for the Inspection of Gas Meters,
FOR THE STATE OF NEW YORK.

AGENT FOR
Seammon's Celebrated Gas Apparatus,
FOR EITHER COAL OR ROSIN GAS.
GAS-FIXTURES OF ALL DESCRIPTIONS.
GAS-FITTING.
GEORGE H. KITCHEN & CO.,
561 BROADWAY, NEW YORK.

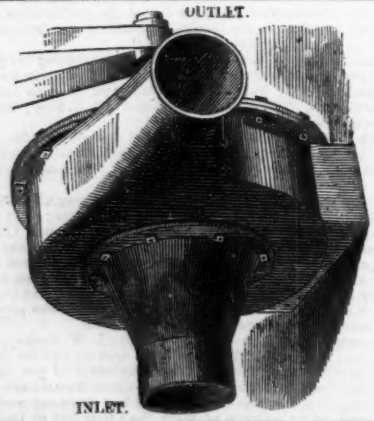


THE ABOVE CUT REPRESENTS MACKENZIE'S PATENT GAS EXHAUSTER (Force Blast.)
It is offered to Gas Companies as a most perfect Machine. They are made of various sizes, capable of exhausting from 5,000 to 150,000 cubic feet per hour.

They require less power, work smoothly, are not so liable to get out of order, and cost much less than the imported ones.

Gas companies intending to use an exhauster, by stating the quantity of gas they may wish to have pass through per hour, will be furnished with a statement of the proper size, and the price of the same, on application to ADDISON SMITH, Manufacturer, New Haven, Conn., or to Messrs. ELLIMAN BROTHERS, New York.

The manufacturer has the liberty to refer to the Albany, N. Y., Gas Light Co., where one has been in constant operation for many months. Another one, capable of exhausting from 50,000 to 70,000 cubic feet per hour, will be in operation in a few weeks, at the St. Louis Mo., Gas Works.



GAS-EXHAUSTERS. — NOWLAN'S PATENT, — Warranted superior to all others. For sale by
SAMUEL NOWLAN, 47 Wall street, New York.

RICHARDSON, BOYNTON & CO.,
MANUFACTURERS AND DEALERS IN BOYNton's Furnaces, Bullard's Steam Heaters, Morning Star, and Pierce Ranges, Stoves, &c., No. 260 Canal street, a few doors east of Broadway, New York.
H. A. RICHARDSON. N. A. BOYNTON. J. A. DURKEE.

DAVID JONES.
ORNAMENTAL JAPANNER, No. 243 NORTH SEcond street, Philadelphia, respectfully solicits a liberal share of patronage from the manufacturers of Gas-Meters and others. He is prepared to execute all orders for Japanning promptly and reasonably.
Reference—Code, Hopper & Gratz, Gas-Meter Makers, Phila.

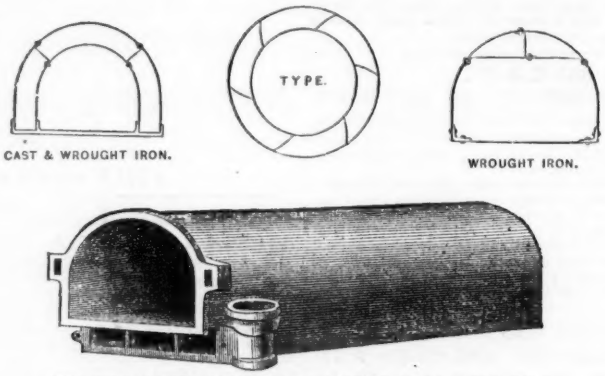
D. McDONALD & CO.,
No. 51 LANCASTER STREET, ALBANY, N. Y.
MANUFACTURER OF
Station Meters, Wet Meters (with Iron or Tin Cases,)
Dry Meters, Fancy, Experimental and Show
Meters, Gas-Holders for Testing Meters,
Pressure Guages, &c., &c.

We wish to call the attention of Gas-Light Companies, Gas Engineers, and all others who contemplate the purchase of Gas Meters, to the fact that we are now manufacturing, and prepared to fill all orders in the above line upon terms as favorable as any other manufacturers in the country.

Having improved, simplified, and so far perfected the mechanical construction of our Meters as to render them unquestionably equal, if not superior to any others now in use, we can confidently offer them to purchasers as such. The extreme simplicity of our Dry Meters renders their wear and liability to get out of order, less than any other Meter in the market. First-class workmen only employed, and the best materials used. All work warranted. ☞ Meters sealed by the State Inspector, according to the laws of New York.

Adapted to the Manufacture of Gas

CELLULAR RETORT.



Patented by C. M. Cresson, Oct. 2, 1854.

from Rosin, Coal, Wood, &c.

Now in use of the Philadelphia Gas Works. Patent Rights for sale. For information apply to
HENRY S. HAGERT, Attorney for Patentee.
S. E. Corner of Walnut and Sixth Street, Philadelphia, Pa.

CANNEL and COAL
OF THE BEST DESCRIPTIONS
FOR MAKING GAS AND COKE.

ANALYSES OF CANNEL,
Showing, from the most recent tests, the productive power (in volume) of each kind of material.

	GAS. Per ton, 2240 lbs. In Cubic Feet. At 60° temperature.	COKE. Per ton, 2240 lbs. Cwt.	Qrs.	Lbs.	Quality of Coke.	Ammonia Water in Gallons.	Tar in Gallons.	Illuminating power * per burner consuming 5 feet Gas per hour.	Price per ton free on board vessels in Liverpool	Price at $4.80 per £ sterling.
1	11,700	13	2	7	ood.	16	19	22.50	17s.	$4.08
2	11,000	13	1	16	"	18	16½	21.25	15s. 6d	3.72
3	10,000	11	2	0	Inferior.	25	15½	20.00	14s.	3 36

ANALYSES OF COAL.

No.	GAS Per ton, 2240 lbs In Cubic Feet.	COKE. Per ton, 2240 lbs. Cwt.	Qrs.	Lbs.	Quality of Coke.	Ammonia Water in Gallons.	Tar in Gallons.	Illuminating power * per burner consuming 5 feet Gas per hour.	Price per ton free on board vessels in Liverpool.	Price at $4.80 per £ sterling.
1	11,000	13	1	16	Good.	16	11¼	14.00	11s. 6d.	$2.76
2	9,690	13	3	0	"	27	10	10.40	9s. 6d.	2.28
3	9,300	13	2	0	"	24	12	9.80	8s. 6d.	2.04

* Equal to Spermacetti Candles, burning 120 grs. per hour.

The above analyses embrace the best Cannel and Coal raised in the Lancashire, &c., districts, and are tabulated, for safety, rather below the average results. They are large, well screened, and free from dirt when delivered on board vessels, and are used for gas purposes at the chief gas works in England and on the Continent.

Orders for less than 50 tons, (*i. e.*, a boat load,) will be charged the cost of carting, viz., 1s. 6d. per ton.

The prices quoted will in all cases be subject to such alterations, more or less, as the case may be, as may arise in the market between the issue of this offer and the time at which the order may come to hand.

TERMS:—Cash, on presentation of the bills of lading at your bankers or agents in Liverpool, or as may be otherwise arranged, less 2½ per cent. discount

Also, HAND PICKED CANNEL and COAL, for house use.

Concessions in prices made for large quantities.

GAS APPARATUS of all descriptions and on the most approved principles. Also, Purifying and other materials supplied.

ANALYSES, PLANS, and ESTIMATES, and other information required, and the highest references, furnished on application.

Contracts for materials and works entered into. No charge made for superintending shipments, preparing bills of lading, or passing entries.

EMANUEL TURNER & CO.,
Export Offices, 34 Castle street, Liverpool, England.

JONES & LENNIG,

Nos. 313 & 315 NEW MARKET STREET, above Vine street,

Philadelphia, Pa.,

Invite particular attention to their

Patent Excelsior

ROTARY VALVE,

And Patent

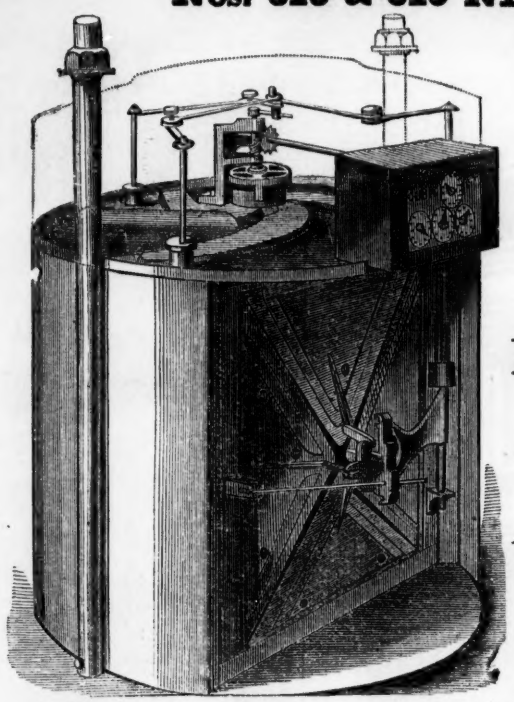
INLET CONDENSING CHAMBER

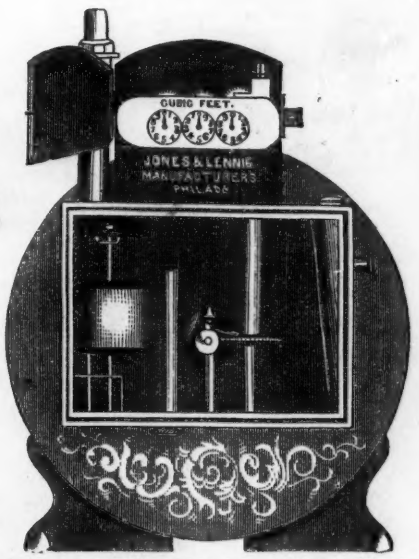
DRY GAS-METER,

And to their

UNSURPASSED

WET GAS-METER.





Both of which are certified, by experienced Gas Engineers, Builders and Superintendents of Gas works to be equal, if not SUPERIOR TO ANY OTHER METERS MADE.

We challenge investigation from whatever source, and DEFY EGOTISTICAL ATTEMPTS TO CRUSH FAIR AND HONORABLE COMPETITION.

Our drums weigh, invariably, from 2 lbs. 7 oz. to 2 lbs. 11 oz. and in point of material and workmanship we guarantee them to be *second to none in the country.*

Read the following Certificate from an old and experienced Gas meter manufacturer and inspector:

Philadelphia, December 1st, 1859.

Messrs. JONES & LENNIG,—GENTLEMEN:—As you requested, I took apart your three-light wet Gas Meter, and find it to be a *very fair* sample of *materials and workmanship;* the different parts are made and put together in a *workmanlike* manner, and will *compare favorably* with meters of other makers, and find the whole meter to weigh 10 lbs., 9 oz. and the drum to weigh 2 lbs., 7½ oz. The Drum Metal is No. 25, by the wire guage.

Yours Respectfully, GEORGE ELLIOTT.

This Meter was taken indiscriminately from a stored lot, and *not got up for the purpose.* Mr. Elliott gave the above certificate free of bias and influence; and his extensive and practical knowledge of Meter-making, entitles it to merit and confidence. We also placed the meter in the hands of Mr. Elliot, by *request* of one of the Board of Directors of City Works. Meters for use in New York will be sealed by the Inspector of that State.

FIRE CLAY GAS-RETORTS.

PERCETON FIRE-CLAY WORKS,

KILMARNOCK, SCOTLAND.

THESE Retorts stand unrivaled, and are adopted invariably by the BRITISH GOVERNMENT in all their Works. They are renuered unusually smooth and free from cracks, thus preventing leakage and the adhesion of Carbon to the interior.

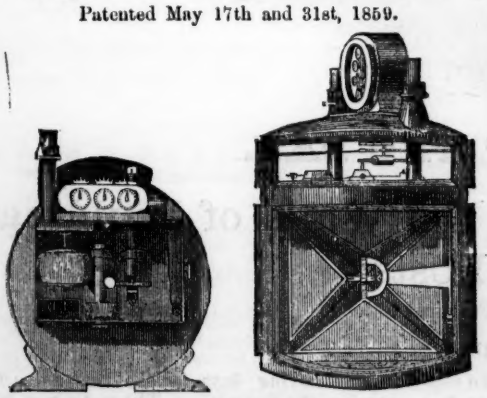
JOHN GILKISON & CO.,

90 BEAVER ST., NEW YORK CITY, *Sole Agents for the United States and Canada.*

HARRIS & BROTHER'S

Improved Dry Gas-Meter,

Patented May 17th and 31st, 1859.



HARRIS & BROTHER,

MANUFACTURERS OF EVERY DESCRIPTION OF

GAS-METERS AND GAS-APPARATUS,

No. 1117 Cherry St., Philadelphia.

GIRARD TUBE WORKS.

MURPHY & ALLISON, PROPRIETORS. WROUGHT Iron Coke-Welded Tubes for Gas, Water, Steam, &c. Wrought, Cast, and Malleable Iron Fittings, Steam and Gas Cocks, Valves. Also, Galvanized Tubes and Fittings.

OFFICE, 1008 MARKET STREET, PHILADELPHIA.

NEW YORK GAS BURNER CO.,

346 BROADWAY, ROOM 18, APPLETON'S Building,

Manufacture to order L. E. Hicks' Patent Gas Burner for Lighting Streets, Steamboats, Railroad Cars, Churches, Theatres, Stores and Private Dwellings.

This Burner has been subjected to every known test, of the justness of its claims in repeated instances, and by competent persons,—and had the unqualified approval of the late Professor W. H. Ellet, Chemist to the Manhattan Gas Light Company, and of Mr. J. K. Brick, Superintendent of the Brooklyn Gas Works.

The experiments of these gentlemen prove that its "economy" over ordinary burners in the consumption of Gas, for equal illuminating powers, is in the ratio of 232 to 100.

We think this array of authority at least entitles our new Burner to a full and fair trial

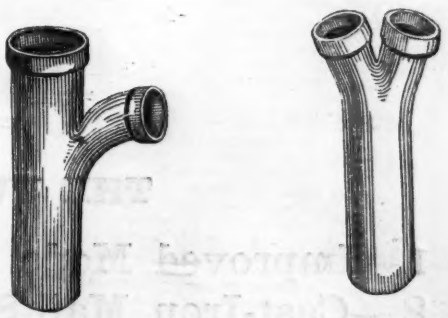
---

COLWELL & CO.,

MANUFACTURERS OF PIG IRON AND CAST Iron Gas and Water Pipes, No. 207 North Water street and 206 North Wharves, Philadelphia

STEPHEN COLWELL, W. DWIGHT BELL,
THEO. TREWENDT, SAMUEL FULTON

SECOND HAND PHOTOMETER AND PRESSURE Guage for sale, in complete order and nearly new. Address, "PHOTOMETER," at Rooms of AMERICAN GAS-LIGHT JOURNAL.



JOHN GILKISON & CO., 90 BEAVER STREET New York City, importers of Fire-Clay Pipe, for Water and Sewer Purposes, from 3 to 36 inches diameter, Fire-Bricks, Vent and Linings, and all descriptions of Fire-Clay Manufactures.

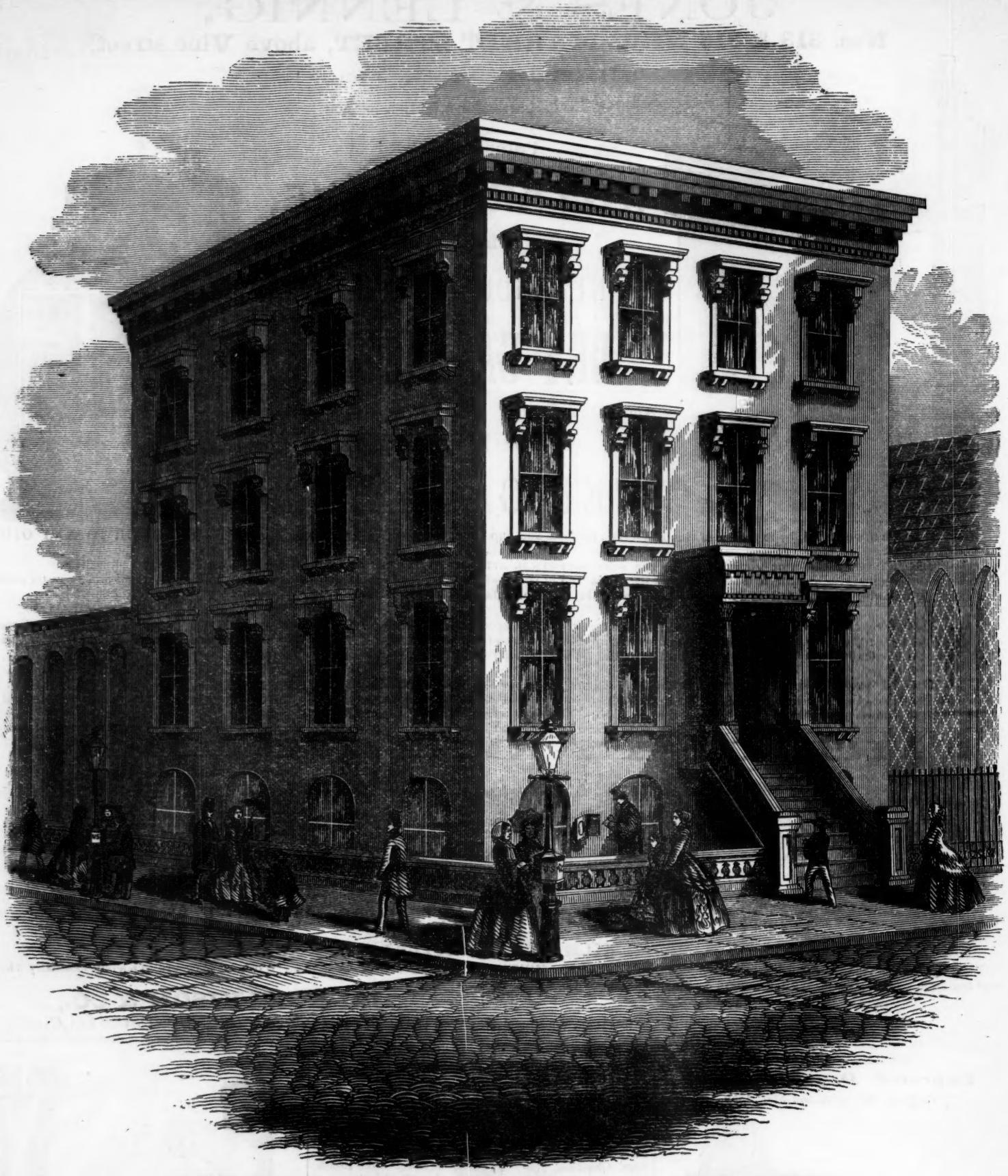
JOHN NEWKUMET,

PHILADELPHIA FIRE-BRICK WORKS, VINE and Twenty-third streets, Philadelphia,

Manufacturer of all kinds of FIRE-BRICK, GAS-HOUSE TILES, to suit all the different plans in use. Clay Retorts and Dentists' Muffles. Orders filled at short notice.

MANY, BALDWIN & MANY,

49 JOHN STREET, NEW YORK, AGENTS FOR Gautier's Clay Retorts, Fire and Arch Bricks, Gas-House Tiles &c. Black Lead Crucibles for Steel Works and Brass Founders. A full assortment of Tiles and general Hardware.



THE TWO GREAT PATENTS OF THE DAY.

1.—Improved Mode of Setting Gas-Meters in the Walls of Buildings.

2.—Cast-Iron Mail-Stations for Public Lamp-Posts.

Adopted by the UNITED STATES GOVERNMENT for the Principal Cities.

ALBERT POTTS, Philadelphia, Patentee.

By the FIRST IMPROVEMENT the Meters may be inspected at any time from without, by the agents of the Gas-Company having keys for that purpose. Thus burglars need no longer gain admittance to dwellings under pretense of examining the meters, while they, in fact, examine the fastenings. The meter-box, being neatly and securely imbedded in the front wall, the meter is protected against frost by means of a thick pad on the back of the door. It has been satisfactorily tested in long continued severe weather and found to be eminently successful.

The SECOND IMPROVEMENT speaks for itself. The cities of New York and Philadelphia are already supplied with these boxes, and the convenience to the citizens and increase of revenue to the Post-Office Department are most marked. Always in sight, securely fastened to the most public objects, protected by light, day and night, they have become the most popular of all modern improvements and will be immediately adopted throughout the country.

Both of these improvements are to be seen at the Rooms of the AMERICAN GAS-LIGHT JOURNAL, New-York City. For further information address the Proprietor of this JOURNAL, who is authorised to contract for the use of both Improvements, or

ALBERT POTTS, Philadelphia.

OFFICIAL.

TIME TABLE

FOR LIGHTING AND EXTINGUISHING THE

PUBLIC GAS LAMPS,

FOR THE YEAR 1860.

MONTHS.	DATE.	Begin to Light.	Begin to Extinguish.	MONTHS.	DATE.	Begin to Light.	Begin to Extinguish.
		H. M.	H. M.			H. M.	H. M.
JANUARY, ...	1	4.45	6.20	JULY, ...	2	7.45	3 15
	8	5.00	6.20		9	7.45	3.15
	15	5.00	6.20		16	7.40	3.15
	22	5.15	6.15		23	7.40	3.15
	29	5.15	6.15		30	7.25	3.30
FEBRUARY,..	5	5.30	6.00	AUGUST, ...	6	7.25	3.40
	12	5.40	5.45		13	7.10	3.50
	19	5.45	5.45		20	7.10	3.50
	26	6.00	5.30		27	6.45	4.15
MARCH, ...	5	6.00	5.30	SEPTEMBR, .	3	6.30	4.15
	12	6.15	5.15		10	6.20	4.30
	19	6.15	5 00		17	6.15	4.30
	26	6.30	5.00		24	6.00	4.45
APRIL, ...	2	6.30	4.45	OCTOBER, ...	1	5.45	4.45
	9	6.40	4.20		8	5.40	5.00
	16	6.45	4.15		15	5.30	5.00
	23	7.00	4.00		22	5.15	5.15
	30	7.00	4.00		29	5.00	5.15
MAY, ...	7	7.15	3.30	NOVEMBER, .	5	5.00	5.30
	14	7.20	3.30		12	4.45	5.45
	21	7.30	3.15		19	4.40	5.45
	28	7.30	3.15		26	4.35	6.00
				DECEMBER, ..	3	4 35	6.00
JUNE, ...	4	7.40	3.15		10	4.35	6.00
	11	7.40	3.15		17	3.35	6.00
	18	7.45	3.15		24	4.40	6.15
	25	7 45	3 15		31	4.40	6.20

RULES AND REGULATIONS TO BE OBSERVED BY THE

PUBLIC LAMP-LIGHTERS

OF THE CITY OF NEW YORK.

1. Each Lamp-Lighter will be furnished with the following articles :—

One Cleaning Ladder,
One Lighting Ladder,
One Pair of Tongs,
One Pair of Plyers,
One Brush, and
Friction Matches.

2. The Lamps shall be Lighted and Extinguished in strict accordance with the time specified in the printed table, prepared by the Superintendent of Lamps and Gas, a copy of which will be furnished each Lighter.

3. One hour will be allowed each Lighter, to Light and Extinguish the Lamps in his district.

4. Each Lighter shall keep his burners in good order, and change them whenever they fail to give a full flame. He shall carry a small brush, for the purpose of cleaning the burners. In Lighting the Lamps, the full head of gas must be turned on, and gradually checked, until a steady flame is produced.

5. The Lamps must be kept clean at all times, and must be cleaned whenever they require cleaning. The bottom glass must not be taken out. They must be kept properly glazed, and in no case shall a broken glass remain in a Lamp over one night. Glass will be furnished the lighter on application to the Superintendent, at the Office of the Gas Works, cor. 1st Avenue and 110th street.

6. Each Lamp shall be made to burn with a clear, steady flame. If there be any obstructions in the pipe which the Lighter can not remedy, he must report the nature of the difficulty to the Superintendent, at the Office of the Gas Works, between the hours of 8 and 9 o'clock, A. M., or between 5 and 6 o'clock, P. M. In case any Lamp-Post or Lantern, shall have been broken or injured in any manner, the Lighter, in whose district such post may be, shall report the same, as soon as possible after knowledge of the same, to the Superintendent.

7. Particular attention must be given to the doors of the Lanterns, in order that they may be always properly fastened : and the bottom glass must, in all cases, be left in its proper position after lighting.

8. No Lighter will be permitted to delegate the duties of his office to *any person*, except by express permission of the Superintendent. In case of sickness, or other unavoidable cause of absence, he must report the fact to the Superintendent, when a substitute will be allowed, who may draw such pay as he may be entitled to for the time he may have lighted.

9. When in the performance of his duties, should any Lighter be addressed by any of the Officers of the Department of Lamps and Gas, Inspectors of Lamps, Police,or citizens, who may desire to speak on matters concerning the Public Lamps, proper and civil responses must be made.

10. Whenever a Lighter may have occasion to change his place of residence, he shall immediately notify the Superintendent of the fact.

11. Each Lighter will be held responsible for the proper care of the Lamps in the district lighted by him ; and he is not to regard any orders or directions except those received from the Officers of the Company, or the Superintendent ; and should he neglect to comply with *any of the above Rules and Regulations*, he will be subject to dismissal immediately after such neglect.

STREET DEPARTMENT, BUREAU OF LAMPS AND GAS,
New York, January 2nd, 1860.

The above Table shows the time for Lighting and Extinguishing the Public Lamps during the year 1860. All the Lamps to be lighted within an hour from the time of commencing. Lighters of Public Lamps will be governed accordingly.

WILLIAM GAYTE,
Superintendent of Lamps and Gas.

LOCKE & CRAIGIE, Plumbers and Gas-Fitters, No. 12 East 20th street, New York.

LOCKE, CRAIGIE & CO., Gas-Fittings, Chandeliers, Brackets, Globes, &c., No. 927 Broadway, New York.

☞ Particular attention paid to country work.

BAKER'S IMPROVED LOW-Pressure, Self-Regulating Steam-Warming and Ventilating Apparatus, for warming and ventilating private dwellings and public edifices. Its advantages are cheapness of construction, entire safety from explosion or fire ; its self-regulation, economy in fuel, inability to freeze, quickness of operation, steadiness of heat, freedom from noise, simplicity, and ease of management and durability.

For Pamphlets descriptive of the Apparatus, apply to BAKER & SMITH, No. 36 Howard st., N.Y.

D. APPLETON & CO., IMPORTERS and Dealers in American and Foreign Books, publishers of Appleton's Railway Guide and of Appleton's Dictionary of Mechanics—a work indispensable to all engaged in the manufacture of Gas. 346 Broadway, New York.

WM. L. SCHOENER & CO. Engineers and Contractors for the erection of Coal Gas-Works, 134 and 136 William street, New York city.

GEORGE DWIGHT, H. A. CHAPIN, WM. L. SCHOENER.

REFERENCES TO GAS-WORKS.

Springfield,	Mass.	Thompsonville,	Ct.
Milford	do.	New Britain	do.
Clinton	do.	Norwalk	do.
Beverly	do.	Norwich	do.
Ware	do.	Tarrytown	N. Y.
Glasgow Mills	do.	Clyde	do.

Wheeler and Wilson Works, Bridgeport, Ct.

TIFFANY & COMPANY, Jewelers and Importers of elegant artistic PARIS GAS CHANDELIERS, BRACKETS, PENDANTS, &c., in Bronze and Gilt.
No. 550 BROADWAY, NEW YORK.

NEW YORK BELTING AND Packing Company, Manufacturers, under Goodyears's Patent, of VULCANIZED RUBBER FABRICS, adapted to mechanical purposes, Machine Belting, Steam Packing, Hose, Gas-Fitting, &c., Nos. 37 and 38 Park Row, New York.
JOHN H. CHEEVER, Treasurer.

OFFICE OF THE MANHATTAN Gas-light Company.

At an election held on the 9th instant, the following gentlemen have been elected Directors of the Manhattan Gas-light Company for the ensuing year :

Moses Taylor,	John R. Ludlow,
Henry Young,	Uriah J. Smith,
John Alstyne,	Benjamin W. Bonney,
John A. Robinson,	John J. Phelps,
William V. Brady,	Charles Roome,
John J. Cisco,	Floyd Smith,
Wm. H. Smith,	Henry A. Hurlbut,

Benjamin B. Sherman.

At a subsequent meeting of the Board, Charles Roome, Esq., was unanimously elected President, and Floyd Smith, Esq., Vice-President.
S. H. HOWARD, Secy.

OFFICE OF THE NEW YORK Gas-Light Company, Jan. 17, 1860.

At an election held at this office on the 9th instant, the following named gentlemen were chosen directors of this company for the ensuing year :

William W. Fox,	Guy Richards,
Joseph Kernochan,	Edward J. Woolsey,
Najah Taylor,	Joseph Sampson,
Joseph Walker,	Lindley M. Hoffman,
Thomas W. Pearsall,	Wm. A. Hadden,
John W. Livingston,	Wm. C. Pickersgill, and

John H. Adam.

At a subsequent meeting of the Board, Wm. W. Fox was unanimously re-elected President, John Mowton, Manager, C. L. Everitt Secretary.

OFFICE of THE METROPOLITAN Gas-light Company, No. 402 Fourth Avenue, New York, Jan. 20, 1860.

The following named gentlemen have been elected directors of this company for the ensuing year :

Christian H. Sand,	Edward Schell,
C. Godfrey Gunther,	Joseph Noble,
Eugene S Ballin,	Washington S. Whitney,
Edward Haight,	John D. Scott,
Hermann Marcuse,	James Hoy,
Thomas Achelis,	Robert H. Arkenburgh.

At a meeting of the Board of Directors held this day, CHRISTIAN H. SAND was unanimously elected President. W. TITUS, Secy.

SUPERINTENDENT OF GAS-works wanted—one with a perfect knowledge of their operations, and a practical gas-fitter. The works are small, using but two benches of their retorts each, situated in a healthy town in Illinois, where board is from $10 to $15 per month. Address "President," Rooms of AMERICAN GAS-LIGHT JOURNAL, New York.

SUPERINTENDENT of Gas-works wanted for a Southern State. A first-class man is wanted, who can come well recommended and will be willing to work negroes as assistants, and is without conscientious scruples with regard to slavery.

Address M. A K. J., Rooms AMERICAN GAS-LIGHT JOURNAL, New York.

GAS-LIGHT SHARES FOR SALE, in various City Companies, paying from six to twelve per cent. dividends :

Adrian, Mich.	Leavenworth, Kans.
Albion, N. Y.	Middletown, Ct.
Batavia, N. Y.	New London, Ct.
Bridgeport Ct.	Portsmouth, O.
Brooklyn, N. Y.	Staten Island, N. Y.
Chicago, Ill.,	Tarrytown, N. Y.
Cohoes, N. Y.	Utica, N. Y.
Evansville, Ind.	West Troy, N. Y.
Ithaca, N. Y.	Yonkers, N. Y.

GAS-LIGHT SEVEN PER CENT. MORTGAGE BONDS $20,000, COMPANIA ESPANOLA, Havana, Cuba, being the balance of original loan, and the only indebtedness of this wealthy Company, secured by upwards of a million of dollars of property. Principal and interest payable in New York City.
JOHN B. MURRAY, Banker,
Iron Buildings, No. 254 Canal street, East, corner of Elm street, near Broadway, New York City.

TRANER, JONES & CO., 117 North Water street, and 124 North wharves, Philadelphia, AGENTS FOR FLORENCE & MERCER FOUNDRIES, ELK STREET IRON WORKS.

CAST IRON STREET MAINS ; *Bends, Branches, Chemical Retorts, and all kinds of Castings for* GAS-WORKS, either COAL or ROSIN WORKS. SHEET IRON FOR GASOMETERS *cut and punched to order.* BOILER IRON *of all descriptions.* RUSSIA SHEET IRON, TIN PLATES, BLOCK TIN, COPPER, PIG LEAD, SPELTER, and Metals generally.

REGULATORS FOR GAS, Saving 15 to 30 per cent. These Regulators have been tested during the past two years, under all the varied circumstances of gas consumption, and have proved themselves SELF-ACTING, NON-CLOGGING, and in every way PERFECTLY RELIABLE. They can be easily attached to meters or pipes, and do not obstruct the flow of gas to the burners when the street pressure is low, nor allow them to "blow" when it is high. See AMERICAN GAS-LIGHT JOURNAL for Nov. 1859, p. 74.
JOHN H. COOPER,
114 North Seventh st., Philadelphia, Pa.

CAST IRON WATER, GAS, Drain, and Heater Pipes, &c., COLUMBIAN IRON WORKS, office No. 46 North Seventh street, below Arch street, Philadelphia.
THOS. ADAMS, Proprietor.

ERICSSON'S CALORIC ENGINE, For driving all Light Machinery, Printing Presses, Domestic Mills, Hoisting Machines, and for all Pumping purposes, may be had at the agency. THE SMALLER SIZES CAN BE DRIVEN BY A GAS-LIGHT.
No. 164 Duane street, cor. Hudson, New York.
JOHN B. KITCHING.

MORRIS, TASKER & CO., PASCAL IRON WORKS,
[ESTABLISHED 1821.]
PHILADELPHIA, manufacture Wrought Iron Welded Tubes for Gas, Steam or Water ; Lap Welded Boiler Flues,
GALVANIZED WROUGHT IRON TUBES,
ARTESIAN WELL PIPES,
of Wrought or Cast Iron, screwed together, flush inside and out ; Gas-works Castings, Retorts and Bench Castings for Coal gas works ; Cast Iron Street Mains, Bends, Branches, Drips, &c.
GAS AND STEAM FITTERS' TOOLS, &c.
STEPHEN MORRIS, CHAS. WHEELER,
THOMAS S. TASKER, STEPHEN P. M. TASKER.

R. D. WOOD & CO., Manufacturers of Cast Iron, Gas and WATER PIPE ; RETORTS, LAMP-POSTS, &c. S. W. corner 4th and Chesnut streets, Philadelphia. Works at Millville, N. J.
S. V. MERRICK, J. VAUGHAN MERRICK,
W. H. MERRICK.

SOUTHWARK FOUNDRY, Philadelphia.
MERRICK & SONS, Engineers, manufacturers of every description of Gas Machinery.
Retorts, Bench Castings, Condensers, Washers, Scrubbers, Wet or Dry Lime Purifiers, Coke Wagons, Fire Tools, Wrought Iron Grate Bars, Gasholders, either TELESCOPIC OR SINGLE, WITH SUSPENSION FRAMES COMPLETE ; Wrought Iron Roof Frames, for Iron or Slate ; Stop Cocks, Exhausters, Steam Pumps, Boilers and Tanks, Steam or Hand Air Pumps for proving Street Mains, Centre Seals, Governors, Wrought or Cast-Iron Lime Sieves for Purifiers, Purifier Hoisting Machines, &c., &c.
Address— MERRICK & SONS,
5th and Washington Streets, Philadelphia.

OREGON FOUNDRY, Nos. 740, 742, 744 Greenwich street, New York.
HERRING & FLOYD, proprietors, manufacture Gas Compensators of all sizes, Self-Acting Valves, Exhausters upon an improved plan, coating less than half those of English manufacture, also castings of every description for Gas and Water-Works.
Herring & Floyd offer for sale Sabbaton's Patent Screening Shovels for coke and coals, made of malleable iron, of all sizes ; Sabbaton's Patent Improved Cast Iron Furnace Frame and Door, arranged to protect the iron work of the door and frame from direct contact with the fire ; also Floyd's Patent Malleable Iron Retort Covers, only quarter of an inch thick, but of convex form, and of great strength, as is attested by certificates from several of the leading Gas-works in America. For engravings of all the above patents see AMERICAN GAS LIGHT JOURNAL for October, 1859, pages 65 and 71.
Samples of the above castings can be seen at the Rooms of the AMERICAN GAS-LIGHT JOURNAL, No. 254 Canal street, East, near Broadway, New York.

G. COTTINGHAM, 64 Green st., Albany, N. Y., manufacturer of Improved Gas Burners, for Coal or Rosin Gas, with Brass Tips that will not corrode.
Warranted superior to any other manufacture in the United States.
Deductions made to the Trade. All orders from any part of the United States attended to.

STUART & PETERSON, Willow street, above Thirteenth, Philadelphia, Manufacturers of LAMP POSTS and CAST IRON STREET-LANTERNS.
P. S.—Our Cast Iron Lanterns are warranted to outlast three Tin Lanterns.

HARPER & O'CONNELL, MAN-facturers of Gas Shades and Globes of every description. FRENCH COLORED GAS SHADES AND SMOKE BELLS. Nos. 63 and 65 Elizabeth street, corner Hester, New York.

MARSHALL LEFFERTS & BRO., 90 and 92, Beekman street, New York, Importers and Dealers in Metals, Tin Plates Sheet Iron, Copper, Block Tin, &c., for GAS METER MAKERS ; also, manufacturers of GALVANIZED SHEET IRON, Galvanized Wire, Nails, Spikes, &c. Sheets corrugated and fitted for roofing. Pig Iron, Lead Pipe, Sheet Lead, Shot and Bar Lead.

HUNTER, KELLER & CO., Manufacturers of
WROUGHT-IRON PIPES, AND FIXTURES
of all descriptions, for
STEAM, WATER AND GAS,
144 Centre street, New York.

M'KENZIE & O'HARA, Plumbers and Gas-Fitters, No. 326 FOURTH STREET, CORNER OF MERCER ST., NEW YORK.
Water Closet Pans, Wine Basins, Wash Basins, Sinks, Fountains, Jets for public and private purposes, Stop-cocks, Filters, and all other Water apparatus.
ALSO, a complete assortment of Gas-fixtures, Pendants, Chandeliers, Brackets, &c &c.

NEW YORK FIRE-BRICK Manufactory. (Branch Works at Kreischerville, Staten Island.)
B. KREISCHER & CO, office 56 Goerck street, corner Delancy street, New York.
GAS-HOUSE TILES and FIRE BRICK of all shapes and sizes. FIRE MORTAR, CLAY, and SAND articles of every description made to order at the shortest notice.
B. KREISCHER, M MAURER, A. WEBER.

THOMAS NICHOLL, GAS AND Steam Fitter and Plumber, Nos. 170 and 172 Centre street (next door to N.Y. Gas Co.'s office), New York. Pipes inserted in Churches, Factories and Dwellings ; Chandeliers re-gilt.
Jobbing promptly attended to.

TABLES OF GERMAN GAS-WORKS.

	TOWNS.	Owners.	Capital in Dollars.	Cubic Feet of Gas made per annum.	Wood, Coal, Turf, Oil or Rosin	Public Lamps.	Private Lights.	Price per 1000 Feet.
								$ c.
1	AACHEN,	†			Coal.			1.40
2	ALTENBURG,	*	46,900	5 900,000	do	170	1919	1.77
3	ALTONA,	**	666,750	30,000,000	do	920		1.45
4	ANCLAM,	P	42,000	2,000,000	do		700	2.12
5	ANNABERG,	P			Wood.			2.33
6	ANSBACH,				Coal.		2000	2.40
7	ASCHAFFENBURG,	C	36,000		do			2.32
8	AUGSBURG	*		22,900,000	do	485	8438	2.45
9	AUSSIG,	P						
10	BADEN	P			do	102	1000	3.00
11	BAIREUTH,	P	34,200		do	265	1574	2.40
12	BAMBERG,	* & C	74,000		do	345	2004	2.74
13	BARMEN,	††	137,200	18,600,000	do	440	650 M's	2.31
14	BERGEDORF,	P	11,200		do	64	400	2.61
15	BERLIN,	C	2,000,000	362,897 300	do	3881	75,691	2.31
16	Do.	†		239,000,000	do		40,000	2.18
17	BIEBRICH,	P			do			2.00
18	BIELEFELD,	C	46,200	3,600,000	do		1200	2.33
19	BINGEN,	C	20.000		do	115	1030	2.80
20	BOCHUM,	C	26,600	2,023,900	do	54	1042	1.87
21	BONN,	P			do	298		2.10
22	BRAUNSCHWEIG,	††			do			3.50
23	BREMEN,	C	330,000	33,742,000	do	1523	13,892	3.15
24	BRESLAU,	††	379,225	59,386,540	do	1030	14,345	2.23
25	BRIEG,	C	46,200	4,000.000	do	150	1100	1.98
26	BRUNN,	P		32,000,000	do			2.00
27	CALBE a-S,	*						2.10
28	CANNSTADT,	P	20,000	1,425,376	do	78	1100	2.80
29	CARLSRUHE,	*			do			2.24
30	CELLE, (Hann.)	P	49,000,000		do			1.75
31	CHEMNITZ,	P			do			1.75
32	COBLENZ,	*			do			2.65
33	CREFELD,	P	140,000	16,000,000	do		5400	2.10
34	CRIMMITSCHAU,	*	28,000	4,500,000	do		1200	1.85
35	DANZIG,	C	159,400	62,470,000	do	757	5036	1.75
36	DARMSTADT,	*	100,000	8,0 0,000	Wood.	501	5750	2.80
37	DESSAU,	¶	61,467	4,913,890	Coal.	205	2500	2.10
38	DEUTZ,	P			do			2.45
39	DOEBELN,	C	23,000		do			1.85
40	DRESDEN,	C			do			1.75
41	DUSSELDORF,	P	122,500		do	430		4.66
42	DUISBURG,	P			do			1.75
43	ELBERFELD,	P			do	349		1.50
44	ELMSHORN,	*	21,000	1,916,200	do	52	1060	1.75
45	ERFURT,	¶	113,243	9,554,510	do	406	3947	2.00
46	ERLANGEN,	C & P	51.200		Wood	185	1406	3.10
47	ESSEN,	††	39,200		Coal.			1.75
48	EUPEN,	P	42,000		do			2.10
49	EUTIN,	P	21,000			86		1.68
50	FLENSBURG,	P			do		2000	1.88
51	FRANKFURT a-M.,	†			do			1.60
52	Do.	C	300,000		O.& R.		23,000	4.00
53	FRANKFURT a-O.,	¶	143,192	15,454,049	Coal.	408	4803	2.10
54	FREIBERG,	††	17,500	1,758,823	do		940	2.56
55	FREIBURG,	C	28,800	5,000,000	do		3500	2 40
56	FURSTENWAULDE,	C	19,600		Wood.			1.75
57	FURTH,	*	72,000		Coal.	260	2077	2.77
59	GERA,	*	35,000	4,000,000	do		1450	2.00
60	GIESSEN,	P	54,000		Wood	206	1846	2.40
61	GLADBACH-RHEYDT,	¶	73,500	8,962,440	Coal	111	3467	1.75
62	GLAUCHAU,	*	42.000		de			1.98
63	GLOGAU,	P	70,000	5,411,900	do		1650	2.10
64	GLUCKSTADT,	P	18,900		do			2.27
65	GORLITZ,	C	95,900	9,500,000	do	422	3345	2.56
66	GOTHA,	*	48,600	6,709,750	do		3197	2.45
67	GRATZ,	P	80,000		do		2800	1.90
68	GROSSENHAYN,	* & C	24,500	3,382,800	do		1783	1.75
69	GUSTROW,	P	35.000		do	131	1110	2.20
70	HAGEN,	¶	59,500	6,179,250	do	86	2227	2.10
71	HALLE a-S.,	C	164,000	10,848,000	do	492	2379	1.75
72	HAMBURG,	C	1,212,500	225,000,000	do	4544	10,200	1.70
73	HAMM,	*	35,000		do			2.33
74	HANAU,	P	36,000	3,500,000	do		3000	2.00
75	HANNOVER,	†		49,000,000	do		8000	1.07
76	HARBURG,	P			do	200		2.80
77	HEIDE,	C	36,000		Turf.	141	1462	1.40
78	HEIDELBERG,	R			Coal			1.80
79	HEILBRONN,	P	60,000	6,500,000	do	164	2500	2.80
80	HIRSCHBERG,	P	24,500		do	107	600	2.10
81	HOF,	*	38,400	2,700,000	do		1100	2.10
82	HOMBURG v-d-H.,	P			Oil.		300	5.40
83	ITZEHOE,	*	35,000		Coal		1500	1.75
84	KAISERSLAUTERN,	††	36,000		do	170	1500	2.00
85	KASSEL,	*			do			3.15
86	KEMPTEN,	†	50,000		W.& T.	159	1384	3.00
87	KIEL,	*	131,000	13,000,000	Coal	321	2945	1.40
88	KOBURG,	*	44,000		Wood.	190	2450	2.77
89	KONIGSBERG,	*	230,000	47,401,096	Coal	1028	9551	1.42
90	KOLN,	†			do	777	17,000	2.05
91	LANDSBERG a-d-W.,	††			do		580	
92	LANDSHUT,	*	40,000		Wood	183	717	2.75
93	LANGENBERG,	P	84,000		Coal			
94	LAUENBURG,	P	8,400	974,500	do		1000	1.40
95	LEIPZIG,	C	245,000	43,000,000	do		11,000	2.15
96	LENNEP,	*	22,400	2,348,800	do		1000	1.75
97	LIEGNITZ,	C	56,000		do			2.10
98	LINZ,	A			Wood.		2458	
99	LOBAU,	C	28,000		Coal			2.15
100	LUCKENWALDE,	¶	73,500	4,002,027	do	60	1707	2.10
101	LUDWIGSBURG,	C	30,000		do			2.80
102	LUBECK,	C	126,000	26,266,456	do	783	4119	1.40
103	LUDENSCHEID,	P			do			2.20
104	LUNEBURG,	††			do	329	670	1.75
105	MAGDEBURG,	††	280,000	38,408,470	do	764	11,444	1.75
106	MAINZ,	C	120,000	25,635,660	do	800		2.00
107	MANNHEIM,	C	80,000		do	670	6000	2.00
108	MEISSEN,	*	23,500		do			
109	MINDEN,	*	31,500		do			3.36
110	MOLLN,	P	9,800	1,000,000	do			1.50
111	MUHLHEIM a-Rh.,	*	22,400	3,000,000	do		800	2.20
112	MUHLHEIM a-d-R.,	¶	70,000	9,749,800	do	82	3215	1.75
113	MUNCHEN,	*	446,000	36,934,800	do	1260	13,090	2.40
114	MUNSTER,	C	63,000		do			2.10
115	NAUMBERG a-S.,	P	28,000		do			2.10
116	NEUMUNSTER,	P	30,000		do	86	1000	1.35
117	NEUSTADT, Holst.	P	12,600		do	37	60 M's	1.57
118	NORDHAUSEN,	¶	63,000	5,000,000	do		1987	2.10
119	NURNBERG,	P			do			2.20
120	OFFENBACH,	*		4,000.000	do		2214	2.60
121	OLDENBURG,	P	42,000	6,000,000	do	262	1200	2.45
122	OLDESLOE, Holst.	P	18,200		do	50	500	2.37
123	OSNABRUCK,	*	57,000		do			1.75
124	PADERBORN,	P			do	86		3.00
125	PASSAU, Bav.	P			Wood.			
126	PFORZHEIM, Bad.	P	30,000	10,000,000	Coal	142		2.60
127	PINNEBERG, Holst.,	*	10,000		do	55	1111	1.57
128	PLAUEN,	C		1,500,000	do		850	2.00
129	POSEN,	C	140,000		do			2.20
130	POTSDAM,	¶	140,000	16,000,000	do	613	4611	2.10
131	PRAG,	P	358,000	80,000,000	do	1000	7200	2.50
132	RATZEBURG,	P	12,600	1,250,000	do			1.60
133	REGENSBURG, Bav.,	*	100,000		do	364	2062	2.80

	TOWNS.	Owners.	Capital in Dollars.	Cubic feet of Gas made per annum.	Wood, Coal, Turf, Oil or Rosin.	Public Lamps.	Private Lights.	Price per 1,000 Feet.
								$ c.
134	ROBEL,	P	10,000		Coal			1.86
135	ROSTOCK,	C	160,000	16,000,000	do	576	5200	1.50
136	SAARBRUCKEN,	P	42,000	3,000,000	Coal			2.10
137	SALZBURG,	P			Wood.			
138	SCHLESWIG,	*	70,000		Coal	155	900	2.10
139	SCHWEINFURT,	*	50,000		do	145	1540	3.00
140	SCHWERIN,	P			do			1.63
141	SEGEBERG,	*		1,250,000	do	80		1.57
142	SOMMERFELD,	C	38,500		do		1200	2.10
143	SONDERSHAUSEN,	C	21,000		Wood.			2.10
144	STARGARD,	††	52,000	18,000,000	Coal	170	295	2.10
145	STETTIN,	C	190,000	26,500,000	do	671	7500	1.90
146	STRALSUND,	C	74,000		do	320	1471	2.10
147	STUTTGART,	††			do	554		2.40
148	TILSIT,	C	56,000		do	180	1379	1.57
149	TRIER,	P		4,500,000	do	166		2.33
150	UETERSEN, Holst.,	P	20,000		Turf.	98	450	1.40
151	ULM,	C	80,000		Wood.	328	2361	2.60
152	WEIMAR,	*	70,000	3,000,000	Coal		1300	2.10
153	WIEN,	†			do	5640		1.75
154	WIESBABEN,	*	75,000	8,800,000	do		4500	2.36
155	WISMAR,	P	(?)35,000		do			2.00
156	WURZBURG,	C	100,000	10,000,000	Wood.	350	5105	2.40
157	ZITTAU,	P	56,000					1.75
158	ZWICKAU,	††	35,000	3,000,000				2.10

† Imperial (London) Continental Gas Association.
¶ German Continental Gas Association.
* Do. Gas-Light Stock Company.
†† Do. Gas-Light Association.
** Do. Gas and Water Company, Hamburg.
A Austrian Gas Company in Trieste.
C City.
P Private.
R Rhenish Gas-Light Association.

NOTE.—These cities are called in these Tables by their real names, which are spelled correctly. It is about time that they should be placed in this respect on a footing with the cities of other countries.

STATISTICS OF GERMAN GAS WORKS.

It is very difficult to give a clear idea of German gas affairs by statistical tables. Though English measure is used to a large extent, the capacity of the cubic foot varies in the different German States, and even cities, and the price of the gas is expressed in different currencies. The latter, at the same time, is regulated, in many places, according to the market value of coal, the annual production of gas, and the amount of gas used by the private consumer. The illuminating power of the gas is expressed in spermaceti, wax and stearine candles of varying weights and lengths, for a varying hourly consumption of gas; mention being seldom made of the kind of burner, or the pressure of the gas, during the determination of its photometrical value. It is indeed much to be desired to have a general standard adopted for the determination of the illuminating power of gas, or rather two standards—one for coal gas and one for wood gas; without them a correct comparison is impossible.

In the statistical tables—which we have compiled carefully—above, English measure and American money have been used; the illuminating power had to be omitted. The bulk of the information has been obtained by Mr. Oechelhauser, Director-General of the German-Continental Gas-Association in Dessau, and by the editors of the German Gas Journal (see June number, 1858). The statistics, though meagre in many respects, are taken from official reports of Gas-light companies and magistrates of the cities, and may on that account be supposed to contain correct statements.

To the Imperial Continental Gas Association in London belongs the credit of having introduced gas-lighting into Germany. They erected their first works in Hanover. Berlin (partly), Wien, Koln, Frankfurt, A. M. and Aachen, are lighted by gas made in English works. The smaller capitals and towns abandoned the old way of obtaining light at a comparatively recent date. Private companies and individuals found it a remunerative investment to furnish gas to their fellow citizens, and acquired the right to do so by contract with the city magistrates, in which the price per 1000 cubic feet is stipulated. The compensation paid for the street lamps is about sufficient to cover the expense of making the required gas, the amount of which is computed from the number and size of the burners, and the burning time. The cities have usually the right reserved of annulling the contract with the gas companies after a certain period, and of purchasing their property at its real value. In many instances the gas works are city property and are managed on city account, no profit being allowed beyond a sinking fund to cover the erection of the works. It does not seem, however, if we are to judge from the tables, that a great deal of saving is thereby effected.

A number of cities—about fifteen—are lighted by wood gas. Among them may be mentioned Darmstadt, Erlangen, Giessen, Linz, Passau, Regensburg, Ulm and Wurtzburg. Without entering into a discussion about the relative value of coal and wood gas, it may interest the readers of the AMERICAN GAS-LIGHT JOURNAL to compare the geographical situation of these cities with the distribution of the German coal fields The deposits of bituminous coal are limited to the northern part of Germany—Silesia, Saxony, and the Rhenish provinces of Prussia. South Germany is destitute of gas coal. This want has, apparently, been to some extent supplied by wood.

GEORGE H. KITCHEN & CO., Manufacturers of Fixtures for Gas Light purposes, Wood's Building, No. 561, Broadway, New York. Office of the Inspector of Gas Meters for the State of New York.

BRAMHALL, HEDGE & CO., 442 Broadway, New York, offer for sale Shaw's Patent
Gas Cooking Stove, 8 sizes, Gas Laundry Stoves,
Gas Steak Broilers, Gas Bath Room Stoves,
Gas Smoothing Irons, Gas Heating Stoves,
Gas Nurse Lamps, Gas Oyster Roasters,
Gas Bread Toasters, Gas Ovens, 5 sizes,
Gas Hatters' Irons, MiniatureGasFurnace.
Call and see them at 442 Broadway, between Howard and Grand streets, New York.

TO GAS-LIGHT AND WATER Companies:
SARONY, MAJOR & KNAPP, practical Lithographers, Engravers and Printers, No. 449 Broadway, design and execute CERTIFICATES OF STOCK for Gas and Water Companies; also, CHECK AND NOTE BOOKS, with Vignettes of Meters, Gas-Holders, Reservoirs, &c., and all other special and commercial work, at the lowest prices.

BRADBURY M. JOHNSON, GAS- Fitter and Plumber, No. 111 East Eighteenth street, New York.
A large and elegant assortment of CHANDELIERS, BRACKETS, &c. Gas-Pipe and Posts made for Gas Companies on favorable terms.

OUR CHILDREN. — A FOND PARENT'S REVERIE.

[From the *London Journal of Gas-lighting.**]

It is a time-honored and goodly custom at this season of the year, for Paterfamilias to gather his offspring around him, to introduce them to his friends, and to rejoice and make merry. He feels proud in presenting Tom, Dick, Harry and Jonathan, as chips of the old block, and enjoys the thought that they will preserve the family name, and assist in handing down to posterity the hard-earned reputation he has acquired. We beg to be permitted to share with Paterfamilias these pleasures of the season, and to introduce to our many friends the offspring of the *Journal of Gas-lighting*, now assembled round our table from various parts of the world.

Our first-born, *Le Journal de l' Eclairage au Gaz*, saw the light in Paris on the 15th of April, 1852, and speaks the French tongue like a native. He was somewhat sickly in his youth, but after he got strong on his legs he became very vivacious, and was apt to be led astray by the force of imagination. The speculators of the Paris Bourse not unfrequently took advantage of this failing, and induced him to puff wild schemes that had no substantial foundation. In the exercise of our parental duties we have from time to time pointed out his errors, and we must do him the justice to say that when the bubbles have burst he has been ever ready to admit that he was in fault. He is, indeed, a very good boy on the whole, and has done much service in diffusing a knowledge of gas-lighting in the country of his birth.

Our second child—alack! no more—the *Gas and Water Times*, was born in London in the month of July, 1853. He was never well from the hour of his birth, and it was throughout his life a struggle for existence. He indulged a perverted taste for four-shilling gas, which we endeavored to correct, and urgently recommended more fattening nutriment, but it was in vain. He became fretful and quarrelsome, and declined rapidly, in spite of his parent's advice and constant offer of richer food, till at last, in June, 1858, he died of atrophy, a martyr to a bad cause. He left all his worldly possessions to the *Joint Stock Ledger*, who followed him to the grave twelve months afterwards. Let us shed a tear to their memories, and introduce our third son—

Le Gaz. This intelligent youth (excuse a father's fondness) was born in the same city as his eldest brother, on the 10th of February, 1857, and he has continued to breathe the atmosphere of Paris. There is a strong resemblance between the two brothers, and they might, from their external appearance, be mistaken for twins; but on intimate acquaintance it will be found that they differ in many particulars. *Le Gaz* is of more sober temperament, and, with deference to our first-born, we are inclined to think is more intelligent than his oldest brother, and he not unfrequently delivers discourses that his parent is proud to quote. In the outset of life, he professed to advocate the interests of gas consumers: but he now makes little profession of that kind, and devotes his attention principally to the exemplification and improvement of the various processes connected with the manufacture and distribution of gas. The dress and appearance of both youths are eminently French, which peculiarity we trust will be excused, considering they had the misfortune to be born in Paris.

Our fourth offspring, the *Journal für Gasbeleuchtung* (Journal of Gas-lighting), came into the world at Munich in July, 1858, and continues to reside there.—Though so young, he is old in experience; and the ability and steadiness with which he has conducted himself have secured him an extensive circle of friends throughout Germany, in which country we are glad to observe that gas-lighting is making rapid progress. Though it does not become a parent to be partial, yet, in the outpouring of our confidence at this privileged season, we feel free to confess a preference for *Gasbeleuchtung*. He is very methodical and well-conducted, and possesses much valuable information; and when he wishes to explain his meaning more fully by illustrations, he executes them with a degree of neatness and care that his brothers would do well to imitate. Though all three children speak in foreign tongues, and have acquired foreign habits, we are happy to say they duly recognize their English parentage; and it is with no small satisfaction we observe they frequently quote our words, and refer to us as a standard authority. The two sons at Paris regularly present themselves at our table once a fortnight to give an account of themselves, like dutiful children; *Gasbeleuchtung*, being at a greater distance, comes but once a month. We need scarcely say that we look forward with pleasure to their periodical visits; and on the present occasion they are all collected together, side by side with their youngest brother, whom we have now to intoduce.

The AMERICAN GAS-LIGHT JOURNAL being the youngest, is naturally the spoiled child of the family, and takes great liberties, not only with Paterfamilias, but with everybody else. He is as yet only an infant, having been born in New York on the 1st of July last; but he is remarkably precocious. Little Jonathan slaps his "guv'nor" on the shoulder, declares him to be a 'cute old file, that goes ahead like greased lightning; but nevertheless he can put him up to a thing or two worth knowing. The little chap then turns his quid, squirts his tobacco-juice within a hair's breadth of our face, and struts about, looking as smart as a thoroughbred Yankee. To say the truth, our youngest son is full of conceit and devoid of modesty. He thinks no one is half so knowing as himself, but he is not particular about appropriating the knowledge of others. That he should often take the words out of his parent's mouth, and use them as his own, is perhaps excusable, as he may consider them to be family property; but if by chance we adopt any of his sayings without acknowledgment, he is awfully riled. In the "States" they seem to like what John Bull thinks objectionable; for, to judge by his own account, he is a very great favorite, and he talks of numbering 100,000 friends and supporters. He contrives to collect a greater number of advertisements than his father and brothers collectively can do, and in this department of business we must give him the credit of being remarkably 'cute. The true philosophy of life, according to little Jonathan, is concentrated in advertising, and we will give our friends in England the advantage of hearing what he says on this subject, hoping they will profit by it, and follow the illustrious example of Mr. Albert Potts, the great Philadelphian philosopher:

"Mr. Albert Potts, of Philadelphia, is a philosopher. He understands not only how to invent, but how to profit by his inventions. The first step towards this is judicious advertising. Our last number contained an extended notice of Mr. Potts' gas-light mail stations. Mr. Potts estimates that notice to have been worth already 20,000 dollars to him; he has accordingly engaged an entire page of the AMERICAN GAS-LIGHT JOURNAL for two years to come, to illustrate his last invention, and *has paid us liberally for the two years' advertisement in advance.* We shall try to make this worth 100,000 dollars to him. *It is a pleasure to work for those who appreciate our efforts.* But our advertising pages are full of philosophers. Pity that Diogenes put out his lamp so soon; there are many wise men left."

It is in such like remarks that young Jonathan shows he has a sharp eye to business. He is ready to turn his hand to anything to forward the main chance—whether it be to puff himself or any other philosopher, to sketch portraits, or to write verses, so that he goes ahead. He is ever blowing his own trumpet with a strong breath, that is somewhat offensive to the ears of Britishers. In the last blast we hear that "from Maine to Texas, the AMERICAN GAS-LIGHT JOURNAL is extending the sphere of its influence,"† and that while gas companies are limited to local districts, his district is the whole world.—His portraits, we hope for the sake of the originals, are as unlike as possible; as to his poetry—let it speak for itself:

> "O sextant (sexton) of the meetin-house, which sweeps
> And dusts, or is supposed to! and makes fiers,
> And lites the gas, and sometimes leaves a screw loose,
> in which case it smells orful—worse than lam-pile," &c.

Though we must candidly confess that some of the peculiarities in our American child's conduct are drawbacks on his character, yet he has some good stuff in him, and we have hopes that he will amend his manners in time. He is yet but a bantling.

Taking them altogether, are they not a promising family? and have we not reason to be proud of our children? The *Journal of Gas-Lighting* has given birth to them all, and a further progeny is expected. We trust that this introduction of them will be considered a pardonable vanity at this jovial period, when the old year is passing away, and we are met together to wish one another a merry Christmas.

* "All communications to be addressed to the editor, No. 42 PARLIAMENT STREET, WESTMINSTER."

† "AND TRANSATLANTIC EXPERTS DEEM ITS VOCATION NOT TOO INSIGNIFICANT NOR UNIMPORTANT IN THEIR OWN OPERATIONS, TO INCLUDE IT AMONG THEIR AUTHORITIES."—Why not give the whole sentence while he is about it?

LIT. JON.

GAS-LIGHT DIVIDENDS DECLARED.

Towns.	State.	Div. per ct.	Payable.
Cambridge,	Mass.	5	Feb. 1
Kensington,*	Pa.,	6	Feb. 1
Nantucket,	Mass.,	3½	Feb. 10
Milwaukie,	Wis.,	5	Jan. 15
Norwalk,	Ct.,	4	Feb. 1
Seneca Falls,	N. Y.,	3	Feb. 15
Trenton,	N. J.	2	Jan. 15
Waterford,	N. Y.	10	Jan. 15
Westchester,	Pa.,	3	Feb. 1
Williamsburg,	N. Y.	5	Jan. 12
Williamsport,	Pa.,	5	Feb. 1
Wilmington,	Del.,	4	Feb. 1
Zanesville,	O.,	4½	Jan. 15

* This Company having sold out to the City of Philadelphia, this is the last dividend that will be declared.

GAS-WORKS WANTED IN VIRGINIA.—We had the pleasure of a visit, a few days ago, from Mr. J. M. Heck, of Morgantown, Va., who wishes to contract for gas-works at his place. He says good gas coal is abundant on the spot, costing but three cents a bushel or seventy-five cents per ton. He says, moreover, that there are plenty of small towns in and near his residence that want works, and whoever puts up his, will probably get contracts for others. Morgantown is a thriving village in Monongahela county, Western Virginia, 300 miles north of Richmond. There are but seventy-five darkies in the county, so that it will be easy to light.

PROFESSOR FIFE'S EXPERIMENTS ON GAS BURNERS.

The Editor of the AMERICAN GAS LIGHT JOURNAL.

SIR:—I observe in your meritorious and excellent JOURNAL of this month, a notice in your correspondent's column, of some trials made by Dr. Fife, Aberdeen, on the "Patent American Gas Burner." And as you attach some blame to the English journals for the indefinite way in which American enterprise and invention is brought before the public, permit me to correct the erroneous impression you have accidently been led to entertain. The burners experimented upon by Dr. Fife are not American, and he errs in such a designation. One of these is a patent by W. D. Hart, North College street, Edinburgh, and manufactured by him. The other is patented by a person named Williamson, and lately manufactured by Messrs. J. Milne & Son, Edinburgh. The type of those burners is that patented by H. W. Hart, London, and the various modifications and devices now adopted are all designed to arrive at the same physical law, viz:—a reduction in pressure by mechanical obstructions, to the economical point of combustion. The following observations on these burners, (all of which give nearly similar results,) as manufactured by Mr. Hart, Edinburgh, may not be unacceptable to some of your readers engaged in similar pursuits. These experiments were conducted under an initial pressure of 1.5 inch water, and a jet of gas giving a light equal to a sperm candle consuming 120 grains of sperm, burned in a platina jet for photometric standard.

BURNER USED.	Durability of 0·1 Cubic Feet.	Time for consumption of one cubic foot.	Rate of consumption per hour.	Candle power of Burner.	Light in grains of Sperm per cubic foot.	Difference per cent. consumption being equal.
No. 1,—COMMON FISH-TAIL,....	2′ 53″	28′ 50″	2.08	12·6	726	
No. 1,—PATENT BURNER,.....	6′ 32″	65′ 20″	0·918	6·5	849	16·82
No. 2,—PATENT BURNER,.....	3′ 52″	38·40	1·551	12·75	986	36·63
No. 3,—PATENT BURNER.....	2′ 50″	28′ 20″	2·117	19·	1076	48·2

It will be observed the more favorable results are obtained by substituting the No. 3 patent for the No. 1 common, the increase of light being 48 per cent., while the expenditure of gas is only increased by 0·037 of a cubic foot. Adopting the observations of Professor Fife as published in the London *Journal of Gas Lighting*, 25th Oct., his ratios, comparing No. 1 with No. 1, gives 25 per cent., and No. 2 with No. 2, 40 per cent. in favor of the patent, and taking the average of the No. 3, viz:—3·275 and 2·81, with candle powers of 9·215 and 9·593, gives a per centage in favor of the patent burners of 21·2. Thus far these burners may be considered satisfactory, and for small consumption may be used with advantage by the consumer, but their range is limited, and where large lights are required, or where the initial pressure is low, they cannot in either case be adopted. I enclose my address, but should you desire these observations to be published in the AMERICAN GAS-LIGHT JOURNAL, permit them to appear under the signature of OBSERVATOR.

———— Gas Works, Scotland, 28th Dec., 1859.

ON THE FLOW OF GAS IN PIPES.

The Editor of the AMERICAN GAS LIGHT JOURNAL:

SIR:—In perusing your valuable JOURNAL I have observed several correspondents inquiring into the laws which govern the flow of gas in pipes. As this is a subject of much interest, and of very material importance to Gas Engineers and superintendents of mains, I respectfully submit for your approval a few simple rules, easily understood, and capable of being applied by any man of ordinary education. I have also, for the sake of those of your readers not much experienced in such matters, given practical illustrations and examples.

I have found from direct experiment, and such agrees very closely with other sources of information, that a 2-inch pipe 100 yards long will discharge in one hour, under a pressure of 1 inch, 1030 cubic feet of gas, with a specific gravity of ·665. Assuming this as *datum*, let us illustrate in the first place, the difference of discharge under varying lengths of pipe; second, under different diameters; third, under different pressures; and fourth, under different specific gravities.

FIRST.

Let us consider the result produced by an alteration in the *length* of the pipe; all other conditions remaining the same, the difference will be found in the *inverse ratio* of the *square root* of their lengths. Hence, as the *square root* of the length of pipe to be laid, is to the *square root* of the length of the same diameter of pipe, found to deliver a given quantity of gas, under a given pressure, so is the quantity delivered by the pipe whose *square root* of length forms the second term, to the discharge from the pipe whose *square root* of length is the first term.

EXAMPLE.—A 2-inch pipe 100 yards long discharges in one hour 1030 cubic feet. Required the discharge from the same diameter of pipe, all other conditions except length being the same, which is one mile, or 1760 yards.

As $\sqrt{1760}$ (= 41·9523): $\sqrt{100}$ (= 10):: 1030 = 245 cubic feet.

Or, suppose the length of the pipe reduced to 25 yards, then,

As $\sqrt{25}$ (= 5) : $\sqrt{100}$ (= 10) :: 1030 = 2060 cubic feet.

SECONDLY.

The discharges of gas of the same specific gravity, and under the same pressure, through pipes of different diameters, are as the *squares* of their diameters; hence, as the square of the diameter of a pipe of a given length, discharging a given quantity of gas in one hour, is to the *square* of the diameter of any other pipe, so is the discharge of gas known in the first term, to the discharge from a pipe the *square* of whose diameter is named in the second term.

EXAMPLE.—It is found that a 2-inch pipe 100 yards long under a pressure of 1 inch, discharges 1030 cubic feet per hour. Required, the discharge from a pipe 5 inches diameter, all other conditions being the same. Then,

As the square of 2 (= 4) the square of 5 (= 25) :: 1030 = 6,437 cubic feet.

Or, suppose the pipe required to be 9 inches.

As the square of 2 (= 4) the square of 9 (= 81) :: 1030 = 20,857.

THIRDLY.

The discharge of gas through pipes is governed by the pressure by which the gas holder or Governor is regulated at the works, and provided there are no disturbing causes, the discharge will be as the *square root* of the pressure. Therefore, as the square root of 1 inch, the pressure by which a discharge of 1030 cubic feet was gained, is to the square root of any other pressure, so is the quantity of gas in the first term, to the quantity of gas under a pressure to be named in the second term.

EXAMPLE.—Required, the discharge from a 2-inch pipe 100 yards long by communicating a pressure of 1,7-10 inch.

Then $\sqrt{1}$ (= 1) : $\sqrt{1,7\text{-}10}$ (= 1·3038) :: 1030 = 1343 cubic feet.

If the pressure be increased to 2 inch,

Then $\sqrt{1}$ (= 1) : $\sqrt{2}$ (=1·4142) :: 1030 = 1456 cubic feet.

Or if reduced to half an inch,

Then $\sqrt{1}$ (= 1) : $\sqrt{·5}$ (= ·7071) :: 1030 = 728 cubic feet.

FOURTHLY, AND LASTLY.

We have now to notice that the velocity with which gas travels through pipes, is as the *square root* of their specific gravities; and having ascertained the velocity with which a gas of a specific gravity of ·665 is discharged from a pipe of a given length and diameter, we can (all other conditions being equal) determine the velocity of gas of any other specific gravities. By the same analogy we would say, as the *square root* of the specific gravity of a gas to be named in the first term, is to the *square root* of the specific gravity named in the second term, so is the quantity of gas delivered under the conditions of the second, to the quantity of gas delivered under the conditions of the first term.

EXAMPLE.—We have found that gas of a specific gravity of ·665, propelled by a pressure of 1 inch, gives a discharge of 1030 cubic feet per hour. It is required to know the discharge under the same conditions with a gas having a specific gravity of ·695.

Then as $\sqrt{·695}$ (=8337) : $\sqrt{·665}$ (=·8155) :: 1030 = 1007 cubic feet.

If the specific gravity be 525,

As $\sqrt{·525}$ (=·7246) : $\sqrt{·665}$ (=·8155) :: 1030 = 1159 cubic feet.

Or suppose the specific gravity to be ·400,

As $\sqrt{·400}$ (=·6325) : $\sqrt{·665}$ (=·8155) :: 1030 = 1328 cubic feet.

In order to facilitate calculations and reduce labor I annex tables of the square roots of the length of mains, the square roots of pressures, and the square roots of specific gravities, which will enable any one to calculate for themselves under every condition that can arise. OBSERVATOR.

———— Gas Works, Scotland, January 1860.

TABLE OF THE SQUARE ROOT OF THE LENGTH OF MAIN PIPES FROM TEN YARDS TO FIVE MILES.

Yards.	Square Root.	Yards.	Square Root.	Yards.	Square Root.	Yards.	Square Root.	Yards.	Square Root.	Yards.	Square Root.
10	3·1623	36	6·	62	7·8740	88	9·3808	1300	36·0555		
11	3·3166	37	6·0828	63	7·9372	89	9·4340	1320	36.3318		
12	3·4641	38	6·1644	64	8·	90	9·4868	1760	41·9523		
13	3·6055	39	6·2450	65	8·0623	91	9·5394	2200	46·8946		
14	3·7417	40	6·3245	66	8.1240	92	9·5917	2640	51·3809		
15	3·8730	41	6·4031	67	8·1854	93	9·6436	3080	55·4977		
16	4·	42	6·4807	68	8·2462	94	9.6954	3520	59·3296		
17	4·1231	43	6·5574	69	8·3066	95	9·7468	3960	62·9285		
18	4·2426	44	6·6332	70	8·3666	96	9·7980	4400	66·3325		
19	4·3589	45	6·7082	71	8·4261	97	9·8489	4840	69·5701		
20	4·4721	46	6·7823	72	8·4853	98	9·8995	5280	72·6636		
21	4·5826	47	6·8556	73	8·5440	99	9·9499	5720	75·6306		
22	4·6904	48	6·9282	74	8·6023	100	10·	6160	78·4856		
23	4·7958	49	7·	75	8·6603	110	10·4881	6600	81·2404		
24	4·8990	50	7·0711	76	8·7178	200	14·1421	7040	83·9047		
25	5·	51	7·1414	77	8·7750	220	14·8324	7480	86·4870		
26	5·0990	52	7·2111	78	8 8318	300	17·3205	7920	88·9944		
27	5·1961	53	7·2801	79	8·8882	400	20·	8360	91·4330		
28	5·2915	54	7 3485	80	8·9443	500	22·3607	8800	93·8083		
29	5·3852	55	7·4162	81	9·	600	24·4949				
30	5·4772	56	7·4833	82	9·0554	700	26·4575				
31	5·5678	57	7·5498	83	9·1104	800	28·2843				
32	5·6568	58	7·6158	84	9·1656	900	30·				
33	5·7446	59	7·6811	85	9·2195	1000	31·6228				
34	5·8310	60	7·7460	86	9·2736	1100	33·1182				
35	5·9161	61	7·8102	87	9·3274	1200	34·6410				

TABLE OF THE SQUARE ROOTS OF PRESSURES, FROM 1-10th TO 3 INCHES.

Inches & tenths	Square Root.	Inches & tenths	Square Root.	Inches & tenths	Square Root.	Inches & tenths	Square Root.	Inches & tenths	Square Root.
1-tenth	·3162	·7	·8366	1·3	1·1401	1·9	1·3784	2·5	1·5811
2 "	·4472	·8	·8944	1·4	1·1832	2·	1·4142	2·6	1·6123
3 "	·5477	·9	·9487	1·5	1·2251	2·1	1·4491	2·7	1·6431
4 "	·6324	1·	1·	1·6	1·2649	2·2	1·4832	2·8	1·6733
5 "	·7071	1·1	1·0488	1·7	1.3038	2·3	1·5165	2·9	1·7029
6 "	·7745	1·2	1·0954	1·8	1·3416	2·4	1·5491	3-inch	1·7320

TABLE OF THE SQUARE ROOTS OF SPECIFIC GRAVITIES, FROM ·400 TO ·700.

Specific Gravity	Square Root.	Specific Gravity	Square Root.	Specific Gravity	Square Root.	Specific Gravity	Square Root.	Specific Gravity	Square Root.
·400	·6325	·460	·6782	·520	·7212	·580	·7616	·640	·8000
·405	·6864	·465	·6819	·525	·7246	·585	·7648	·645	·8031
·410	·6403	·470	·6856	·530	·7280	·590	·7681	·650	·8062
·415	·6442	·475	·6892	·535	·7314	·595	·7713	·655	·8093
·420	·6481	·480	·6928	·540	·7348	·600	·7746	·660	·8124
·425	·6519	·485	·6964	·545	·7382	·605	·7778	·665	·8155
·430	·6557	·490	·7000	·550	·7416	·610	·7810	·670	·8185
·435	·6595	·495	·7035	·555	·7449	·615	·7842	·675	·8216
·440	·6633	·500	·7071	·560	·7483	·620	·7874	·680	·8246
·445	·6671	·505	·7106	·565	·7517	·625	·7905	·685	·8276
·450	·6708	·510	·7141	·570	·7549	·630	·7937	·690	·8306
·455	·6745	·515	·7176	·575	·7583	·635	·7969	·695	·8337
								·700	·8367

THE MOTION OF GASES.

Continued from page 130 of the AMERICAN GAS-LIGHT JOURNAL.

THE INTERIOR FORCES OF A GASEOUS BODY.

12. All intelligent persons are probably aware that, if atmospheric air or any other gas be confined in a close vessel, a certain pressure, greater or less, is exerted against the sides—the whole interior surface—of the vessel; that, if more gas be forced into the same vessel by means of a pump, or otherwise, the pressure is increased; that, on the other hand, if a portion of the gas be extracted, the pressure is correspondingly diminished. Now the pressure which a gaseous body exerts against the interior surface of a confining vessel, arises from the action of certain forces within the mass of the gas. These are, first and obviously, the forces of gravity, acting upon every particle of the gas, *in directions vertically downwards*, the aggregate of which, represented by the *weight of the whole gaseous body*, is effective in causing pressure on the interior of the vessel,—greatest at the bottom, diminishing upwards,—entirely in accordance with the laws which govern the pressure of liquids in like circumstances. Secondly, there are forces of attraction and repulsion, acting from particle to particle of the gas, *alike in all directions*, which not only have their sphere of action among the particles, but, unlike the forces of gravity, have their origin among the same particles, hence receiving the significant appellation of *molecular forces*.

Of these two kinds of forces, distinct in their origin, and hardly less so in their action, the forces of gravity in the case of gaseous bodies, exert but little influence. This will be apparent in considering the small weight of even the largest mass of a gas which is ever isolated and brought under practical control. Thus, a body of atmospheric air of 50 feet in height, under the normal pressure of thirty inches of mercury and at the mean temperature of 60° Fah., would exert a pressure on the bottom of the containing vessel but slightly exceeding that due to a depth of water equal to 0.8 of an inch. In general, therefore, we may neglect the small influence of this element in practical cases; still, it may easily be taken account of whenever it shall be deemed expedient.

It is, however, quite different with respect to the molecular forces. For, in gaseous bodies, the influence of these forces is as conspicuous as that of the forces of gravity is insignificant. The molecular forces of attraction and repulsion, as the terms imply, are antagonistic in their action, the former tending to a closer aggregation of the particles of a body, the latter to their wider separation. But experience abundantly shows that there exists a tendency in gases to expand, under a diminishing external pressure, to a degree to which no practical limit can be assigned. From this we are warranted in concluding that in respect to the action of the molecular forces in gaseous bodies, *the repulsions always predominate over the attractions*, a physical characteristic which is perhaps the most significant of the gaseous state.

THE TENSION OF A GAS.

13. It is the balance of the molecular forces, in favor of those of repulsion, which we denominate by the terms *elastic force* or *tension* of a gas. The term *tension* will therefore be understood as applicable to *a pressure tending outwards from the interior of a gaseous body* and always *tending* to expand the gas in every available direction.

THE TENSION AS INFLUENCED BY CHANGES OF TEMPERATURE AND EXTERNAL PRESSURE.

14. But from the nature of a gaseous body, it is at once evident that the tension, as thus defined, must be extremely susceptible of change under varying external circumstances. Of these, there are two, which are directly influential in effecting changes of tension in a gas, namely: *varying external pressures* and *varying external temperatures*.

First. *Influence of a varying external pressure.*—If a gas undergo compression, under an increasing external pressure, its particles continually approximate to closer positions; and the repulsions among these particles being increased in a direct sense according to the degree of the approximations, an increasing tension is developed, whose *reaction* is always equal and opposite to the action of the compressing force. On the other hand, if the gas be permitted to expand, under a decreasing external pressure, its particles continually separate from each other; and the repulsions being decreased as the particles recede from each other, a decreasing tension results, whose reaction is still always equal and opposite to the external force.

Secondly. *Influence of a varying external temperature.*—Any elevation of the external temperature, attended by the transmission of heat towards the interior of a gas, tends to expand it; and since the introduction of heat is thus equivalent to a virtual addition of repulsive force, it follows that an increased tension must result. On the other hand, a depression of the external temperature, attended by a transmission of heat outwards from the interior of a gas, tends to contract it; and since the loss of heat is equivalent to a virtual subtraction of repulsive force, a correspondingly diminished tension must result.

We therefore conclude, that any increase of heat or pressure—of either or both of them—increases the tension of a gas, while any decrease of either or both decreases this tension. In reality, the more usual case is that in which a variation of tension is due to simultaneous variations in both heat and pressure. But it will be expedient to trace separately the laws of action of each upon the physical state of a gas, uninfluenced by the action of the other, and afterwards consider the results of their joint action. We shall therefore proceed in the first place, to consider the laws which control changes of density in gases, consequent upon variations, either of external temperature or pressure, the other being constant.

CHANGES OF DENSITY CONSEQUENT UPON VARIATIONS OF THE EXTERNAL TEMPERATURE OR EXTERNAL PRESSURE OF A GAS.

We shall recognize as self-evident the following statement, namely, that any variation in the volume of a gas is attended by a corresponding variation in density, *one being inversely proportional to the other;* so that the density of a gas increases in precisely the same ratio that its volume decreases, and *vice versa*.

15. *Changes of volume and density due to variations of external temperature, the external pressure remaining constant.—Law of Gay-Lussac.*

We owe to the researches of Dalton and Gay-Lussac, the discovery of the law of expansion of gases by the action of external heat. Gay-Lussac ascertained that a certain volume of atmospheric air, during a change of temperature from that of melting ice to that of boiling water, became increased in bulk by a quantity equal to 0.375 or $\frac{3}{8}$ of its primitive volume at the lower temperature,—the air being permitted to expand without any change in the external pressure; so that a unit of volume, at 32° Fah., became a volume of unity *plus* 0·375, or 1.375, at 212° Fah. Dividing this expansion, or 0·375, by the number of degrees on the thermometric scale from the freezing to the boiling point of water, and we obtain the expansion for each degree of the scale,—that is, *the expansion of a unit of volume for a unit of temperature,*—which is called the *co-efficient of thermal expansion.* It was concluded by Gay-Lussac that *all gases expand alike, and at constant rates*; in other terms, that the co-efficient of thermal expansion is the same for all gases and constant for all temperatures. The conclusion thus enunciated has long been known as the *Law of Gay-Lussac.*

The later researches of other physicists,—those of Rudberg and Regnault more especially,—have shown that the conclusions of Gay-Lussac are not strictly correct. Regnault, in a series of researches on this and kindred subjects of the physics of gases,—as remarkable for the skill of his methods as for the precision of their results,—besides showing that the co-efficient of thermal expansion as determined by Gay-Lussac is a little too large, has also shown that this co-efficient is not only not strictly the same for differentgases, but is not entirely constant for any one of them, during any considerable variation either of temperature or pressure.

Nevertheless, within the limits of those temperatures and pressures more usually presented in practical cases, these variations in the co-efficient of expansion are quite small,—indeed, hardly appreciable. Accordingly, we may adopt from the determinations of Regnault a certain mean value, as the numerical expression for the expansion of a unit of volume, from 32° to 212° Fah., of the more common gases, atmospheric air included. This mean expansion, under external pressures, varying from about 20 to 60 inches of mercury, is *very nearly* 0·367. Hence, dividing this quantity by 180°=212°−32°, and placing e for the co-efficient of thermal expansion, we shall have

$$[5]\quad e = \frac{0{\cdot}367}{180} = 0{\cdot}00204 = \frac{1}{490}$$

and this numerical value of the co-efficient, while very nearly exact for all temperatures and pressures within the limits here assigned, is still practically applicable to temperatures and pressures somewhat beyond these limits.

If now, we represent by V_0 the volume of a gas, under the normal pressure of 30 inches of mercury, and at the standard temperature of melting ice, or 32° Fah.; and if we place t for any other temperature on the same scale, we shall have

$$e\,(t-32)\,V_0,$$

as the expression for the expansion of the volume V_0, during a change of temperature from 32° to $t°$, the initial pressure of 30 inches of mercury being supposed to remain constant throughout the entire expansion. And, accordingly, if we place V for the new volume which results under these conditions, we shall evidently have

$$V = V_0 + e\,(t-32)\,V_0;$$

or

$$[6]\quad V = [1 + e(t-32)]\,V_0;$$

a formula by means of which we may readily compute the volume V, which a volume V_0, at the temperature of 32° and under the pressure of 30 inches of mercury, will become at a temperature t.

For any other temperature t_1 we shall have a similar expression for a different volume V_1 everything else remaining the same; or

$$V_1 = [1 + e(t_1-32)]\,V_0.$$

Dividing one of these equations by the other, and we obtain

$$[7]\quad \frac{V}{V_1} = \frac{1 + e\,(t-32)}{1 + e\,(t_1-32)};$$

or we may have

$$[8]\quad V = \frac{1 + e\,(t-32)}{1 + e\,(t_1-32)}\,V_1;$$

a formula, by means of which, knowing any volume V_1 at a temperature t_1, we may determine the volume V which would result at a temperature t.

But the density of a gas being inversely as its volume, we shall have from [6]

$$[9]\quad d = \frac{d_0}{1 + e\,(t-32)};$$

in which d_0 and d are the densities for the volumes V_0 and V, respectively. In like manner, we shall have from [7] and [8]

$$[10]\quad \frac{d}{d_1} = \frac{1 + e\,(t_1-32)}{1 + e\,(t-32)}$$

and

$$[11]\quad d = \frac{1 + e\,(t_1-32)}{1 + e\,(t-32)}\,d_1 \quad .$$

The preceding formulæ, although constructed under the hypothesis of an increasing temperature are equally applicable to cases in which the temperatures, fall below 32°, only observing that the term giving the expansion *changes its sign*, and, becoming a contraction, must be subtracted from unity.

ON THE USE OF A MIXTURE OF COALS IN GAS MANUFACTURING.

It has long been the practice in many gas works, to mix inferior gas-producing coals with such coals of another class as have the character of decomposing in a manner to afford a gas rich in illuminating constituents, and thus to obtain from the mixture gas of superior quality. In some works the material affording the better gas is decomposed by itself, and known volumes of the gas obtained are allowed to mix with known volumes of the gas produced from an inferior coal. The general impression—so far as is known to me—is, that the economical results do not differ essentially in either way of conducting the decomposition, and that convenience alone would determine whether a mechanical mixture of the coals should be made before decomposition, or a simple mixture of the gases produced allowed to take place in the gas-holders.

A very high authority, the late Alexander Wright, assured me that he had never met with any observations which indicated an obvious advantage resulting from the adoption of one of these modes, not found in the practice of the other, and in the works then under our inspection, the two coals used were decomposed in separate retorts, the gases flowing through a common main.

When we consider the composition of gas-coals as capable of presenting the greatest diversity of products, when modified by heat slowly or rapidly applied, and that the useful substances obtained by decomposition vary in different coals so much in quantity and kind, it certainly appears probable that a mixture of coals in the gas manufacturer's apparatus, will be more likely to afford in their mutual reactions the quality of gas desired, than if these coals are similarly exposed in separate vessels.

The manufacture of oils for illuminating purposes, has extended so far in this country as to afford us very good characteristics on which to found our distinction of coals into classes, with reference to their products of decomposition at low temperatures, and it is probable that a greater number of observations made on coals as consumed in gas producing, will lead to equally exact distinction, from the products afforded at the higher and more suddenly applied heat of the gas retort. In this direction, it appears there is a large field open to the gas-engineer, who is supposed to feel a great interest in the chemical as well as mechanical actions taking place in a gas work.

In presenting this subject, it is my intention at this time to call attention to its importance in a country like our own, where so many varieties of coal are found, and where valuable mixtures of coal may often be made at less cost, for an equal weight, than if a single good gas-coal were chosen.

Experiments carefully conducted and repeated, but not embracing the large number of coals desired, especially American coals, have convinced me of the great importance of mixing the coals thoroughly before decomposing them to produce gas; as a constant result has been, a difference either in the amount and value, or the value of the gas alone, due simply to decomposing the same coals in mixture.

It is certainly an elementary view of the subject contained in the statment that a coal, A, which produces twenty-candle gas alone, when mixed with a coal, B, producing ten-candle gas in equal weights, the resulting gas shall have the mean illuminating power of fifteen candles, volume being considered. This might be the result if they were separately decomposed and the purified gases mixed; but no case has fallen under my notice where so simple relations have been found, after mixtures of different coals have been used.

The coal A, has generally in the trials exerted an action at the moment of decomposition, on the coal B, when mixed with it in different proportions, which can be explained only by the supposition that these mixtures when placed in the hot retort, break up into gases and other products, as different varieties of coal would under the same conditions.

It follows as a consequence of such a conclusion, that the most highly economical proportion in which the coals A and B can be mixed, must, in every case, be determined by experiment, and that however positive our knowledge may be in regard to the products from two coals, separately considered, we cannot predict the amount and quality of the gas which a mixure of them will afford.

In a recent investigation on mixed coals producing oils by slow distillation, the same modifying action was observed to be exerted on the coal B, by varying the additions of different coals of known value of production. The further evidence thus obtained of the action of one coal on another, will be included in the statements of experiments, which will appear in future numbers of the AMERICAN GAS-LIGHT JOURNAL.

PLATINUM.

[ADVERTISEMENT.]

[From the *New York Commercial Advertiser.*]

SAUNDERS' ILLUMINATING WATER-GAS; WHAT IS IT? THE THEORY OF ITS COMBINATION.

The production of illuminating and heating gas from water has occupied the attention of Dr. Saunders for the last five years. This great problem in practical science has been worked upon in England, France and Germany for many years, but the records left us of their investigations, and the repeated attempts to put them into practice, prove that they have all signally failed. Dr. Saunders has been accused not only of having patented analogous processes followed in England, but actually of having copied their specifications in their own language; but those who possess the least ability to judge of chemical processes can at once discern the wide difference between Professor Saunders' process and those of all others who have preceded him. The great error of those who have experimented in Europe has been, that they have attempted to force a gas to combine with carbon. Now a gas is really solid matter combined with heat, and therefore would come under the designation of a caloride. It is impossible to force a gas to combine with carbon, as it is already in combination with caloric. This has been the great error of the European experimentalists, for they have disregarded the great law of chemical combinations, by not taking cognizance of the nascent condition of bodies. Instead, as has been the case with Dr. Saunders, of availing themselves of that moment when the gaseous body is in its nascent state, and thus retaining the compound sought, they have attempted to force a gas or caloride to combine with carbon. Let us explain this still further. The European chemists have passed their water vapor through ignited charcoal in the presence of heated iron, or else through ignited iron *per se*. In either case they get hydrogen gas, while the oxygen of the water is occupied in oxydizing the iron.

This hydrogen gas then combines with one equivalent of carbon, and thus they get light carbonated hydrogen gas. This gas they afterwards attempt to force into combination with carbon, in order to convert it into heavy carbonated hydrogen illuminating gas. Now if they would avail themselves of that moment of decomposition, when the constituent gases of water are leaving their combinations with each other, and before they have combined with caloric, or during their nascent state, as it is termed in chemistry, they would then have Saunders' water-gas. But they have not done this. Instead of bringing all the constituents composing the water-gas, that is, the vapor of the water and the carbonaceous matter, into direct contact in the ignited charcoal, where they would be enabled to combine while in their nascent state, as Prof. Saunders has done, they have attempted to force the elements, after they have assumed the gaseous state, to thus combine; and consequently their failure. This is the great distinction between Saunders' water-gas and those other processes which he has been accused of repeating, but which, it will be perceived, are not at all analogous. In fact, the strongest proof of the non-identity of the American and European processes is simply that the latter admit a failure while the former is a triumphant success.

But there are plenty of people ready to croak against all new discoveries, and who could expect otherwise, than that this great discovery, which strikes at the root of millions of invested capital, should not meet with its fierce and inveterate enemies? This is now the case. The coal interest and that of the railroads which freight it here, together with numbers of opposing interests, will necessarily hoot at the discovery, and attempt to retard its introduction among us; but their opposition will prove a failure for this reason: while it costs from $1 20 to $1 40 per thousand cubic feet to manufacture coal-gas, the water-gas can be manufactured for about forty cents the thousand cubic feet, while it gives about one-third more light. The apparatus for its production costs about one-third that of coal-gas, while it can be produced, each gas being made in retorts of equal capacity, in quantities six times greater than coal-gas. In fact, the advantages in the manufacture of water-gas, over that of coal-gas, are so great, that the omnipotent *public* will see that it is not put down by the powerful monopolies arrayed against it.

But wherefore do not the gas companies avail themselves of this discovery, if it promises such great advantages? This is a natural question, and the discoverer freely admits to us that he was once so unsophisticated as to ask himself the same question, under the impression that the gas companies would respond to it affirmatively; but, bless your soul, reader, how little you know of these great gas companies! You should know that these companies employ a number of persons about their works at very fat salaries.—These persons are, of course, consulted upon all matters pertaining to gas, and their *ipse dixit* at once puts to rest the question. The high functionary of one of our principal gas-works plainly told the discoverer that "it was not convenient to disturb the existing state of things," and that "if water-gas could be manufactured for nothing, it would not be *convenient* to adopt it," and that, therefore, they wished nothing to do with it! There are, however, some exceptions to these instances of selfishness. Among the four hundred gas companies of the United States there are some presidents and engineers who possess sufficient judgment to perceive that the introduction of cheaper processes for the manufacture of gas into their works, must eventually redound to the benefit of all the employees, as well as to the interest of their consumers. A few of these enlightened spirits have already adopted the water-gas, and others, it is thought, will soon follow; for they know, with far-seeing vision, that the time is coming when this new gas must be adopted by those gas-works of the country, which do not desire to be left far behind in the great march of universal progress.

In conclusion, we would speak of the accusations which have been made by the enemies of this gas against its qualities as an illuminator. The odor of the water-gas is pleasant, somewhat resembling that naphthalous smell characteristic of Benzole. Therefore, the statements of interested persons, that the gas possesses the most fetid odor, is erroneous. It is true that upon first admitting the water-gas into pipes through which that vile-smelling stuff, coal-gas, has passed, it is attended with a very offensive odor, but that odor is derived from the debris of the coal-gas, which the denser water-gas quickly absorbs.—As soon, however, as the pipes are thus cleansed, this disagreeable odor ceases, and we get the pleasant naphthalous smell of the water-gas. That the water-gas burns dim, as was asserted, is likewise erroneous. Hundreds of the most delicate photometric experiments have proved that the water-gas, unpurified, gives about one-third more light than coal-gas.

It has been asserted by those whose position in the scientific world should have led them to a thorough investigation, that the water-gas is nothing, when rosin is used as the carbonizer, but rosin-gas diluted with the non-illuminating gases. It has been proved that the water-gas gives one-third more light than coal-gas. If ten per cent. of rosin-gas, when diluted with ninety per cent. non-illuminating, gives equally as great a quantity of light as rosin-gas undiluted, how is it possible for this dilution to take place? Dilution necessarily implies deterioration, while in this case of the "dilution" of the water-gas there is a gain of ninety per cent.! But the *experimentum crucis*, that proof and rectifier of error, will readily answer this question of dilution. If rosin *per se* is allowed to flow into carbon at the particular heat at which we produce the water-gas, it will not be resolved into illuminating gas at all, but, on the contrary, in the presence of the ignited carbon, it appears to undergo a more complete decomposition—so much so that there is a non-illuminating gas issuing from the retort. Thus it appears that the rosin, as we would suppose, is not converted, in the production of the water-gas, into rosin-gas, but into some other carbonous compound, previous to its decomposition into water-gas. It would be well, before persons make assertions about what they do not understand, to at least inform themselves by some practical investigations, and not attempt to guess about them.

Prof. Saunders labored in his laboratory for two years in investigations upon the subject of water-gas. Before commencing his own experiments he repeated all those made by others, and thus he possessed the advantage of others' experience, for there is as much knowledge to be gained by a failure as by a success. He therefore commenced where all others had left off, and thus his success in the rectification of others' failures.

We earnestly hope that universal public opinion and the voice of the press will now compel efficient legislative action to protect us from the vile and atrocious swindling of our city gas companies; their gas has, this winter, attained its maximum degree of impurity, as its light-giving properties and vile smell amply prove to the most stupid observer. We are obliged to discontinue using it, to read or write by, almost entirely. Is there a city of this size on the globe, whose ferries, railways, street-sweeping, light, bread, coal, markets, and servants are so thoroughly given over to such management as this? To show how we suffer, and what might be done for our alleviation, it is only necessary to look at the results of the Croton water government. Suppose we were now obliged to go back to the pumps and Manhattan water, under the management of that prince of robbers a street commissioner? Alas! poor old New York.

SUNNYSIDE.—Mr. A Turner, 447 Broadway, has presented us with a beautiful photo-lithograph of "Sunnyside," the residence of WASHINGTON IRVING. The work is beautiful in itself, and creditable to the artist.

REMOVAL OF CARBON FROM RETORTS.

SIR—Much inconvenience at times arises in gas-works from the accumulation of carbon in clay retorts, and the stopping up of the stand-pipes. I myself suffered from this cause last winter, and was induced to devise a plan, which I believe has not yet been adopted in England, for cleaning out the retorts and pipes; and, as it has been completely successful, a description of the method will, I think, be of some interest to your readers.

My retorts are of clay, 17 feet 6 inches long, and have a mouth-piece at each end. As soon as the deposit begins to be troublesome, I put into one of the mouth-pieces of the retort a wrought-iron pan (shaped to the form of the retort), 18 inches long and 6 inches deep filled with water. Both retort-lids are then put loosely on, and the cover of the stand-pipe at the end of the retort opposite to that in which the pan is placed is taken off. The open stand-pipe acts as a chimney, and draws the steam which is generated along the retort. The steam is decomposed by contact with the graphite, and in about twenty-four hours the latter can be loosened and removed with facility. The tar, &c., in the stand-pipe will also be completely burned out.

GEORGE HOWITZ.

Gas-works, Copenhagen, Dec. 14, 1859.

PSEUDO-INVENTIONS.

SIR—I think your JOURNAL might, and should, become to gas-engineers, foremen, &c., the source of mutual improvement; any useful idea should be given and discussed amongst ourselves in the JOURNAL. I have often laughed at the petty things that are patented, many of which had passed through my mind, and no doubt through that of others of our brethren—had been tried, and rejected. Mean sneaks there are, no doubt, running about amongst gas-works throughout the country, ready to pick up and patent things they see in use, though they may be the invention of some humble gas-manager, when he, poor fellow, soon has to gape with astonishment to see his plan (*a little modified*) a grand patent. Do, Mr. Editor, give our brethren an invitation to assist in this good work, and let us form amongst ourselves a mutual improvement society.

By-the bye, whilst on the subject of patents, please to draw the attention of your transatlantic readers to the advantage of wooden gas-holders. I will some day, when you have induced others to come out of their shells, give my experience with them for the last ten years.

H. W. SMITH.

Seaham Gas works, Dec. 26th, 1859.

TO PREVENT THE DETERIORATION OF COAL-GAS.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL.

Dear Sir:—According to the original statements of Prof. Aiken, and his remarks in reply to Mr. Parmele, published in the AMERICAN GAS-LIGHT JOURNAL, it would certainly add to the reputation, if not to the profits of Gas Companies, to adopt some means of storing their gas whereby it might not be brought in contact with such quantities of water; ever changing on account of imperfect tanks. This could be done by building an outer and inner wall instead of an ordinary tank, and leaving a space some six or eight inches wide between those walls, to be filled with water; thus forming a circular seal for the lower edge of the gas-holder. The inlet and outlet pipes could be secured to the inner wall, and the extra cost of such a wall would be offset by the amount saved in excavating.

H. K. S.

Newton, Mass., Jan. 16, 1860.

POTT'S GAS METER-BOX.

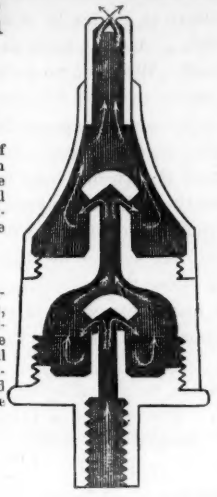
This admirable invention, illustrated upon page 148, has been set up in the basement front of these Rooms, and although exposed to the severe weather in January and at this moment, it protected the meter so effectually that the frost had no effect upon it. We think this improvement of Mr. Potts' will come into general use, as soon as its advantages become thoroughly understood. The Bureau of Streets and Lamps has presented us with a lamp-post on the corner opposite the main entrance. We have attached Mr. JOHN WALTON'S anti-freezing apparatus to the service-pipe where it connects with the main, and shall keep it supplied with Gengembre's fluid, which we have applied with great success at our residence. The small gas works at the north should take note of this apparatus of Mr. WALTON'S. It is simple, very cheap, and is amply certified to be entirely successful. The intensely cold weather of this week has put out nearly all the surrounding lights, while in our lamp post, *with the service pipe entirely exposed to the weather*, the flame is full and brilliant.

Mr. GEORGE COTTINGHAM, of Albany, N. Y., manufacturer of Walsh's patent gas-burners, has affixed to our gallery of burners three of his economisers, which are certainly very superior for American burners We placed them beside Mr. HART'S, and they resembled each other strongly in color, shape, and style of flame. Another burner gallery is being prepared, when we shall have forty different kinds on exhibition, and photometrical tests will then be made of all. Mr. COTTINGHAM advertises his burners in another column. He says he can "lay out" all other burners.

CHAMPION GAS-BURNER

OF THE

UNITED STATES.



MR. GEORGE COTTINGHAM

has had thirty-seven tests with various kinds of Patent Gas Burners, and has come out victorious in all. The challenge is still open for any man in the United States to accept on strength of Light and quantity of Gas. So quit your blowing, you Gas-Burner men of the City of New-York, or face the music. I will put up

$50.00

That I can beat anything in the shape of a Gas-Burner, for Coal or Rosin Gas, in the United States, or any Patent Gas-Burner imported from Great Britain. I will meet any man at any Gas-Works where the necessary instruments are on hand, and will bet that my Burners will increase less with the increase of pressure, as the stores are closing, and that I have the most desirable Gas-Burner, and the best for the consumer in the United States.

G. COTTINGHAM,
ENGINEER
of the Albany N. Y. Gas-Burner Company.

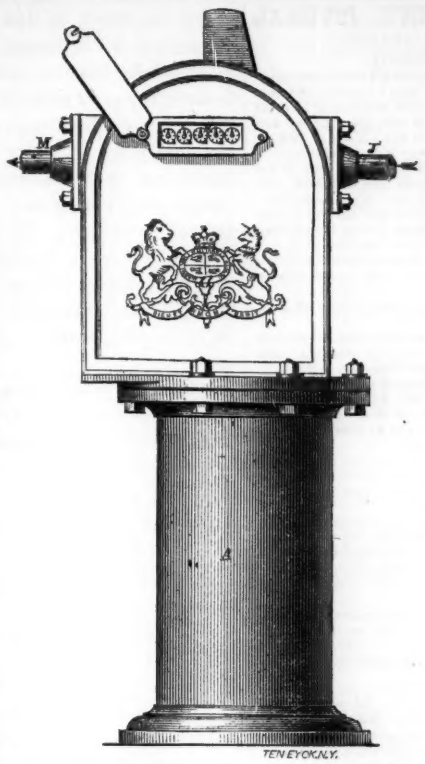
All letters to be addressed to Box K, Albany Post Office.
The challenge, if taken up, must come through the Public Papers, and one addressed to my Office, No. 46 Green Street, Albany, N. Y.

LESTER'S SEWING MACHINES Lock-Stitch, prices from $50 to$150. No. 483 Broadway, New York. Adapted to family use—doing light as well as heavy sewing.

THE WILLCOX & GIBBS' FAMILY Sewing Machines. The best family machine in the market, prices from $30 to $50. 504 Broadway, New York.

GROVER & BAKER'S celebrated Noiseless Sewing Machines, at greatly reduced prices, No. 405 Broadway, New York.

WHEELER & WILSON'S Sewing Machines, No. 505 Broadway, New York. The very best in use. Send for a circular.



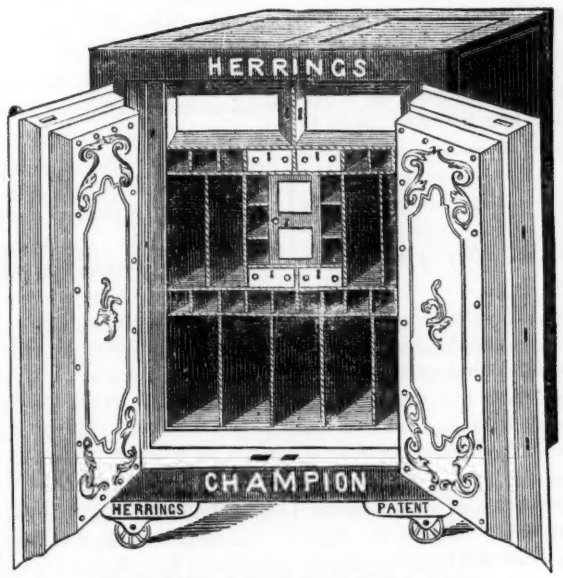
KENNEDY'S
PATENT
Water Meter.

This METER measures water accurately, and has superseded all others in Great Britain and on the Continent of Europe.

Farther information can be given, and innumerable testimonials shown on application to

WM. McKEAN,
74 BROADWAY, N. Y.,
AGENT
FOR THE UNITED STATES.

Fire-Proof Safes for Gas-Light Companies.



HERRING'S
PATENT CHAMPION FIRE & BURGLAR PROOF SAFES,
With Hall's Patent Powder-Proof Locks,

THE same that were awarded seperate medals at the World's Fair, London, 1851, and the World's Fair, New York, 1853, and

ARE THE ONLY AMERICAN SAFES

That were awarded Medals at the London World's Fair These Safes form the most perfect security against Fire and Burglars of any Safe ever offered to the public.

$1,000 Reward!

Will be paid to any person that can show that a HERRING'S PATENT CHAMPION SAFE ever failed to preserve its contents in an accidental fire.

S. C. HERRING & CO.
Manufacturers,
251 Broadway, cor. Murray St., New York, and 52 and 54 Gravier St., N. O.

AGENTS.—B. W. Knowles. Richmond, Va.; R. F. Lester, Petersburg, Va.; Rowland Brothers, Norfolk, Va.; J. H. Thompson & Co., Lynchburg, Va.; J. R. Blossom, Wilmington, N. C.; W. Herring & Son, Atlanta, Ga.; LaRoche & Bell, Savannah, Ga.; J. M. & B. F Reed, West Point, Ga.; Holmes & Co., Charleston, S. C.

NORRIS & GREGG,

DEALERS IN WROUGHT IRON PIPE, AND Manufacturers of Fittings for Steam, Gas, and Water, Nos. 62 and 64 Gold street, (between Beekman and Fulton streets,) New York.

THOMAS H. NORRIS. CHARLES GREGG.

CLEGG'S TREATISE ON COAL-GAS MANUFACture, third edition, with full instructions upon every detail incident to Gas-making, illustrated by engravings. A large supply has arrived No gas company or engineer should be without it.

For sale at Rooms of the AMERICAN GAS-LIGHT JOURNAL, New York.

THE AWFUL HORRORS OF BURNING FLUID.

The most appalling calamity that has probably ever visited a community in time of peace, fell upon the quiet little village of Lawrence, in the county of Essex, State of Massachusetts, twenty-six miles north of Boston, on Tuesday, the 10th of January, at about ten minutes before 5 o'clock, P. M.

At that moment a cotton factory, known as the Pemberton Mills, five stories (sixty-six feet) high, two hundred and eighty-four feet in length by eighty-four feet wide, containing six hundred looms and thirty thousand spindles, fell, while in full operation, not outward, but *directly down*, burying in its wreck and ruins seven hundred men, women, and children, who were at work within its walls. The whole town was at once aroused, and telegraphic despatches sent far and near brought immediate assistance, which was at once put into requisition to relieve the wounded and dying, and remove the dead. But calamities thickened. As night fell, fire was discovered issuing from the ruins of the eastern end, caused by the upsetting of a lamp filled with burning fluid, upon the loose bales of cotton, and so rapidly and fearfully did the flames extend over the two and a half acres of ruins, that the rescuers were driven from the ground, and scores of the entombed victims of this mausoleum were either roasted alive, or suffocated by the steam from the water played upon them.

Horror of horrors! The imagination shrinks at the task of comprehending, much more of describing the details of this story of woe. It is needless to add, first, that the owners had taken care to insure for $415,000 the property which cost them $300,000, against the luck of a conflagration, and secondly that the overseers of the building actually escaped from it unhurt! IT WAS THE WOMEN AND CHILDREN who were immolated by scores, nay, by hundreds. *Upwards of three hundred perished, or were crippled*—MOST OF THEM WERE ROASTED ALIVE!!!

But it is idle to dwell upon this subject; it is worse than idle to point corrupt legislatures to a source of misery which a vote of theirs could forever remove. Hint to them a project for a railroad job or any other piece of rascality that promises a result to them personally, and whiz! a bill is rushed through to the Executive with a will, and if there checked by a veto, a two-thirds vote sends it flying over his head to the Statute Book. But speak only of a bill to relieve our common nature of a vile curse that pours sorrow and distress into families every day in the year, and there is no time to consider it, no one to press it. The remedy lies, we begin to think, with the underwriters, let them unite in refusing to write a building, in which burning fluid is admitted, and it will disappear like a thief before a constable. Have the underwriters the pluck to try it? We doubt it.

OFFICIAL.

NEW YORK STATE INSPECTOR OF GAS-METERS; Office, No. 561 Broadway.

Gas-meters proved since 4th May, 1859..... 15,892
Number of proving apparatus tested..... 36
NEW YORK, January 31, 1860.

GEORGE M. KITCHEN,
State Inspector.

THE AMERICAN GAS-LIGHT JOURNAL
Represents the three important interests—

LIGHT, WATER, AND SEWERAGE.

Its purpose is to ascertain and make known all new discoveries in the science and economical application of GAS-LIGHTING, and promote thereby the interests of companies and of consumers; to encourage and aid the introduction of PURE WATER from Lakes and Rivers into Towns and Cities, and to improve the system of SEWERAGE, VENTILATION, and DRAINAGE everywhere.

Incidentally with these results, the business of all Gas and Steam Fitters and Plumbers; the erection of Gas-Works and Water-Works; the consumption of Coals, the manufacture of Gas-Pipe, Water-Pipe, Steam-Pipe, Gas Fixtures, Gas-Meters, Water-Meters, Retorts of iron and clay, and their varied apparatus; of Drain Pipes, Ventilating, Heating and Dredging Machines will be increased immeasurably.

THERE ARE 20,000 CITIES AND TOWNS IN THE UNITED STATES, CAPABLE OF SUPPORTING GAS-WORKS, WHILE THERE ARE NOT 400 GAS-WORKS IN OPERATION IN THE WHOLE COUNTRY!!!

New works are now springing up, however, every week, and they will continue to increase rapidly hereafter.

Our Tables will present to the capitalist opportunities for desirable investments in the shares of sound and prosperous gas-light and water companies, paying liberal and regular dividends.

Advertisers of Gas, Water, Steam, Sewerage and Ventilating apparatus; of Iron and Brass manufactures, &c., will find the AMERICAN GAS-LIGHT JOURNAL the most desirable medium of any in the United States, going, as it does, direct to the parties concerned in those subjects.

THE AMERICAN GAS-LIGHT JOURNAL is published on the first day of each month. It will be issued more frequently whenever it shall appear to be demanded, and it will be enlarged from time to time to keep pace with the reqirements made upon it.

All new inventions relating to Light, Water, Steam and the Sanitary interests; all legal decisions affecting the rights of companies and consumers; all progressing and projected works; all experiments and plausible theories; in fine, every item of intelligence relating to its prominent *specialities*, will be found in the columns of the AMERICAN GAS-LIGHT JOURNAL.

There is no person living who has not a direct concern in these subjects, and it is by extending our subscription list to the utmost limits that the greatest benefit will result to all; to which end we solicit the kind offices of our friends and of communities.

TERMS—CASH IN ADVANCE.

SUBSCRIPTION—In the U. S. and British Provinces, $3 per annum.
Do. For 10 copies, ordered at one time, $25 per annum.
Do. To English subscribers 13s. per annum; to French and German subscribers, 16f. per annum, payable to our Agents or Bankers, as below.

ADVERTISEMENTS—According to position and space occupied.
Do. Of Gas-light Companies' dividends, $1 each.
Do. Of Plumbers', Gas-Fitters', and Engineers' Cards, $5 per annum each.

☞ Remittances by mail to be addressed to the proprietor,
JOHN B. MURRAY,
IRON BUILDINGS, No. 254 CANAL STREET, EAST, NEAR BROADWAY, NEW YORK CITY.

AGENTS OF THE AMERICAN GAS-LIGHT JOURNAL.

FOREIGN.

Germany..... B. WESTERMAN & Co., of New York.
Great Britain,... LANSING, STARR & Co., 74 King William st., London.
Paris, France..... LE JOURNAL DE L'ECLAIRAGE AU GAZ, 24 Boulevard Poissonière.

BANKERS IN LONDON.

LANSING, STARR & CO., 74 King William street, to whom all payments for our account must be made; and who will forward to us all packages, samples and orders, on payment of charges.

DOMESTIC.

The AMERICAN GAS-LIGHT JOURNAL can be purchased of all the newspaper and periodical dealers in the United States and Canada.

TO CORRESPONDENTS.

Ten copies of each *original communication*, published in the AMERICAN GAS-LIGHT JOURNAL, are, if requested, at the disposal of the author. Authors should specify at the head of their MSS., the number of extra copies desired; it is too late after the forms are broken up.

The titles of communications and the names of authors should be fully given. The articles intended for any number should be sent in, if possible, by the 15th of the month, or the pages may be preoccupied.

THE
AMERICAN GAS-LIGHT JOURNAL.
ISSUED MONTHLY.

WEDNESDAY, FEBRUARY 1, 1860.

We have departed somewhat from the programme established for the management of the AMERICAN GAS-LIGHT JOURNAL, by admitting into its columns to-day, a so-called family sketch from the pen of an English scientific CHARIVARI, which we commend to the notice of gentle readers as the maiden effort of a master mind, illustrated by a clever correspondent of our own, whose initials are familiar to the readers of the popular books of the day. It is the excellence of the illustration that constitutes our apology for boring our readers with the original sketch. We regret that the extreme modesty of the self-constituted head of this interesting family has left a vacuum in the picture by omitting the description of Paterfamilias himself, whose portrait from life is the feature of the artist's group.

This is the first notice and only welcome that little Jonathan has had from this London editor, and it is to be hoped that the appearance of any "further progeny" will be attended with less pain to his would-be Dada than the last.

We all remember the fate of the poor devil who was embraced by a warm-hearted bear. Little Jonathan feels very much as if he had had just such a squeeze from this affectionate Bull, and says he may be obliged to take him by the horns yet.

But the object of this JOURNAL is evidently misunderstood in Parliament street. It has not been established for partizan purposes. We have no *bulls* to issue from our editorial sanctum to force favorite theories down the throats of better men or to promote personal projects. Our entire north-western continent lies twelve hours out of the twenty-four in comparative darkness. Twenty millions of people demand more light. The experience of those who possess it must be brought into the service of those who want it, and to apply and utilise that experience the skill and industry of the manufacturer requires an intelligent medium of communication with the consumer.

It is at this point that we step in, to centralize these wants and means of supply. The AMERICAN GAS-LIGHT JOURNAL has become already the acknowledged organ of the interests it represents; it is *ipso facto* an American "institution," and we are not ashamed of the position it occupies to-day, its seventh month, in a scientific or a business point of view.

This English *savant* says we have a sharp eye to business, and points to our advertisements as a proof. Just so. And we point to them, too, with pride and pleasure. It would be a sorry thing for us if advertisers had not the confidence to entrust us with these little messages to our constituents. We point to the American advertisements, and to those from England and France, as an evidence that we are a BUSINESS JOURNAL, and not a drone or a cynic.

Of this number we print the largest edition yet issued, and besides supplying the post-offices of Baltimore, Md.; Boston, Mass.; Cincinnati, O.; Cleveland, O.; and Providence, R. I.; and filling an order for five hundred copies to one manufacturing house, we send between three and four thousand copies to our agents in England, *to be stamped there* and delivered free of expense to all who are interested in the enterprise. The largest foreign additions to our subscription list yet received, came with the gratuitous advertisement given us lately by one of the so-called English journals.

We are in receipt of a polite letter of welcome from M. EMILE DURAND, Editor-in-chief of *Le Gaz*, the junior French gas journal. This makes the second European welcome we have had, the first and only other being from *Le Journal de l'Eclairage au Gaz*, as previously acknowledged. M. DURAND advises us that he has sent for our acceptance the complete files of his *Journal* from its commence ment, for which we thank him. Now, if we could only hear from Mr. MUNICH, we might get a peep at the *Journal für Gasbeleuchtung*, but as we cannot *spreiken Deutcher*, and as he cannot probably *spreiken Inglisch*, we do not see how it is to be brought about. Perhaps some yankee will get out a patent for bringing us together.

We hear that a contract has been made, or is about being made, for lighting with gas the Metropolitan Hotel block on Broadway, Houston, Prince and Crosby streets, in this city, and that gasworks will be erected on the premises for that purpose. The contract includes the entire square.

Hon. Mr. GOVER, of the Assembly of this State has introduced a bill for the protection of gas consumers, the purport of which is, that the Supervisors of New York and King's counties appoint, the first ten, and the latter five, sworn Inspectors to inspect all gas meters, and test the quality of gas; they are to be paid by the county for such services. No charge to be made by the Gas Companies for any meter located on any consumer's premises, that is a rental. All bills to be equalized as far as practicable; and a proper reduction is to be made, when the inspector proves the gas to be inferior in quality. No agreements are binding if made under the influence of coercion. No unliquidated accounts are to be extorted from any person taking possession of any premises where such unliquidated account may rest, and no gas company shall have the power or right under such circumstances to withhold the gas for business or domestic purposes from any person desiring it. The inspectors are to enter upon immediate examination of all meters in their district, render a true account of such to the consumers, and upon such are to be based their bills. These inspectors are to be sworn officers.

There is an immense amount of "gas" in this bill. The dodge is apparently to get up a few fat offices for political favorites.

HON. MR. MASTERSON has presented a bill to the Legislature of this State authorising the Manhattan Gas-Light Company to lay its mains everywhere within the city limits; in other words, to encroach upon the New-York Gas-Light Company's district below Grand street, for it is already authorised to occupy, and does occupy the district between Grand and Seventy-ninth streets.

We are authorized to state that this bill was introduced without the sanction or even the knowledge of the Manhattan Gas-Light Company, and that if it should be moved before the House, the mover will be called upon for his authority to act, for the Manhattan Gas-Light Company do not want these privileges, never asked for them, and will not have them if offered.

The Metropolitan Gas-light Company announce their organization to-day, with the names of their first board of directors. This company has purchased sixty-four lots of land, comprising the block bounded by 41st and 42d streets, extending from 11th avenue to the North River, including, of course, the water front. They claim for their gas district, that portion of the island of New-York between 42d and 79th streets, although their charter authorises them to lay mains everywhere throughout the city. The Manhattan Gas-light Company now light from Grand street to 79th street, and from river to river; the New York Gas-Light Company that part below Grand street; and the Harlem Company that part above 79th street.

We have received a letter from our friend, SIR AUGUSTUS CLIFFORD, Gentleman-Usher of the Black-Rod, House of Lords, promising to send us such works on Sewerage as he can procure from the British Government. We have been indebted to Sir Augustus for kindnesses in London in years goneby, and shall appreciate his consideration in this instance, as will our readers. Out of the experience of the two worst sewered cities in the world we may perhaps glean something worth knowing.

The Superintendent of Lamps and Gas publishes his official Time Tables for lighting and extinguishing the Public Lamps. Members of the Union, New York and Atheneum Clubs will examine the last column of those tables with interest. The amount paid the various Companies for lighting, extinguishing and cleaning, are as follows.

To the Harlem Gas Light Company, per lamp,			$28.80
" New York	do	"	25.78¾
" Manhattan,	do	"	25.00

The increased price paid to the Harlem Company is caused by its sparsely settled district.

Hon. ANDREW TEN BROOK, U. S. Consul at Munich has favored us with a letter accompanying a copy of Baron Liebig's communication to the *London Times* on the subject of Sewerage and Drainage. Baron Liebig's article is not exactly what we want, still we publish it. We now look to Mr. Ten Brook for something about gas-lighting in Germany. He has the ability and the will to enlighten us on this subject, and we shall expect an interesting communication from his pen.

The resignation of the Hon. MYNDERT VAN SCHAICK, President of the Croton Aqueduct Department, has been received with regret by the Mayor. Sixteen years of honest public service is a rare feature in the life of any man in this age, and very few can bear witness to it as truthfully, in their own cases, as can Mr. Van Schaick in his.

Another of our scientific staff commences, to-day, a series of articles over the signature of PLATINUM

The subject on which he treats is fundamental to the success of gas companies, and he will give it a thorough illustration as he proceeds.

A novel advertisement finds its way into this number, perhaps the first of its kind ever published in any paper. We allude to that of Professor WISE, announcing the establishment of a balloon factory for domestic purposes. The professor says he can put us in the way of keeping our carriage with no horses to eat their heads off, nor wheels to be greased; and if he can only sail us over the sloughs of filth that reek in the streets of this deplorable city, out of the reach of the horns of cattle that meander through its Avenues, and beyond the reach of all the railroad tracks, we will canonize him.

GLENMORE favors us with a continuation of his article on the motion of gases.

We give notice again, that no person is authorised to collect money for the AMERICAN GAS-LIGHT JOURNAL in this country, unless he have our stamped PAID bill. An enterprising genius in Philadelphia writes us that, having occasion to remove his family, (probably because he had not paid his rent,) and pay a doctor's bill, he had called on some of our advertisers there, and collected their bills, but would "make it all right with us pretty soon." This is almost up to "adopting our sayings" in the three pages of tables. We like both in their way.

Of English manufactures the consumption in this country is increasing. The Brooklyn, N. Y. Water Works alone have just laid 6,000 tons of Thomas Edington & Son's cast-iron pipes, besides an enormous amount of Scotch vitrified drain pipes, the only reliable drain pipe that we have seen. Estimates for more than 50,000 tons of various castings are now pending, for use in this vicinity.

A largely increased demand for Gas-Light shares proves the growing confidence in that species of investment. We have now orders for a large amount of shares at a shade below the views of holders who do not seem inclined to make concessions. For a list of shares on sale we refer to our own advertisement.

We have had the pleasure of seeing Mr. CHAMPENOIS, late of Paris, now of the firm of J. K. Brick & Co., Clay-Retort makers, of Brooklyn, N. Y. *Le Journal de l'Eclairage au Gaz*, in its issue of November 20th, 1856, speaks in high terms of Mr. Champenois' retorts, which we intend to examine and report upon.

Attention is called to our list of scientific contributors announced in another column.

Mr. ALBERT POTTS' new page in this number will attract attention. He has selected the most superb mansion on the Fifth Avenue for the display of his two great patents, which are rolling up a fortune to him. We repeat that Mr. Potts is a philosopher, the opinion of any so-called English journal to the contrary notwithstanding.

The English law for the inspection of gas-meters is printed to-day in a supplement, more as a matter of record in connection with the laws of this State and Belgium already printed, than for any especial interest it will excite here.

The attention of American Gas-Light Companies and others is called to *Le Journal de l'Eclairage au Gaz*, the enterprising and interesting Gas-Light Journal of Paris, of which we have spoken before.—The subscription-price of *Le Journal* is three dollars and a half, foreign postage prepaid, but in order to secure a good circulation for it in America, it will be served with the AMERICAN GAS-LIGHT JOURNAL at three dollars per annum, or six dollars for the two. Thus, any of our subscribers remitting us three dollars, will receive the Paris *Journal* for the year from 1st of July last, and hereafter a remittance of six dollars will secure the two Journals annually. *Le Journal* is fully up to the times, containing the latest scientific intelligence well digested, and crowds of illustrated advertisements. We advise our friends to try it for a year. Subscriptions are received at our Rooms.

We are requested to notify gas consumers that collectors of gas bills are provided with authority in writing signed by the President and Secretary of each Company. Bogus collectors have been doing a good trade by calling at up-town residences, threatening to turn off the gas unless the bills presented by them for the last month, were paid instantly. Let all such collectors ber eferred to the master of the house.

Mr. HENRY STARR, of the firm of LANSING, STARR & Co., our bankers in London, has favored us with several calls at our new Rooms, and as he returns to England in the steamer to-morrow, he will attend personally to any orders for us. We commend his firm to those who have business with America.

Samples and specimens of gas, water, and sewerage apparatus will soon arrive, from all parts of the country; and we have advices of retorts, gas-pipes, gas and water meters, and sewer pipes, being in course of shipment from Europe. We will thank those who intend to forward samples, to advise us beforehand of the probable space required. Officers of gas works are calling daily to see the apparatus thus far collected. We shall inaugurate a most interesting and useful institution in this AMERICAN GAS-LIGHT EXCHANGE, and it will do more to cement the peaceful "gaseous" relations of Europe and Amec a than all the Envoys ordinary or extraordinary in creation.

In addition to one or two new English advertisements in this number, we present to-day the nucleus of a French constituency which is about to rally around the AMERICAN GAS LIGHT JOURNAL. The consumption of French gas fixtures, in this country, is enormous, and importers will not fail to observe and make a note of the addresses of Messrs. HUBERT FILS, No. 4 Rue Thorigny, furnishers and contractors of the large gas establishments of Paris, and of Messrs. ERNEST BEUDON ET DALIFOL, No. 19 Route de Choisy-le-Roi, manufacturers of gas-retorts of all shapes and sizes. We hope to receive samples of these retorts to place beside the English and American specimens at our rooms.

EXHAUSTERS.

Among the improvements effected during the last twenty years in the art of gas making, an important place must be assigned to the use of Exhausters. The necessity for this contrivance is based on two well established principles; first, that the economical generation of gas in the retorts is disturbed, except the distillates, as quickly as they are formed, are permitted freely to pass off; secondly, that this free egress is impeded in the ordinary arrangement of gas apparatus, and the new formed gas meets a series of obstacles which, being essential to its purification or retention, cannot be dispensed with, though they oppose its progress.

The Exhauster is a contrivance which diminishes the pressure of these resisting forces and, facilitating the escape of the gas as soon as it is evolved, effects a saving of important products. For thus more gas is made and a richer proportion of the volatilized hydro-carbons is secured.

Few of our practical gas-engineers are sufficiently alive to the fact that the carbonaceous deposit in the retorts is chiefly produced from the decomposition of valuable gas after it has been formed, and that this decomposition and waste are due to the circumstance that the gas cannot fly off and escape as soon as it is generated, but, by the pressure which resists its egress, it is detained in the retort, subjected to the injurious action of heat, and impaired, as we have said, in its brilliance and light-giving properties. The effect, practically speaking is much the same as if valves were accurately fitted to the pipes leading from the retort, and were weighted so as to prevent their opening except by the action of great force from within. The injurious effects of any such valves are immediately seen, and no gas-engineer having any knowledge of his business would allow their presence in his apparatus for a single hour. But, as such valves would not be more injurious in the process of gas making than the same amount of pressure exerted in any other way, so as to produce the same result; the sealing of the dip-pipes in the hydraulic main, the compelling of the gas to force its way through a thick stratum of tar, and the subsequent transit through water in the wash-vessel and through the wet-lime purifiers, where these are used, generates an injurious amount of resistance which cannot be avoided or dispensed with. The weight, also, of the gas-holders augments the accumulating pressure upon the retorts, and the result of the whole is, evidently, very prejudicial to the amount and quality of the gas manufactured.

The evil, then, appears to resolve itself into one simple fact. The stream of gas from the retort to the gas-holder is continuous, and, as modern requirements for purity and brilliance are so exacting, the gas, before it reaches the gas-holder, has to be detained in the various processes of purification, and the consequent pressure necessarily produced on the retorts cannot be prevented without breaking the continuity of flow, and adopting suitable expedients for disposing of the products as they distil over.

The Exhauster, in a very beautiful and effective way, meets the difficulty, for it performs two functions, first, it pumps off, so to speak, the newly evolved gas, as rapidly as it is prudent to remove it; and, secondly, it performs a similar office to that of the wonderfully contrived valves abounding in the blood vessels of the human system, which admit free passage of the fluids in one direction, but prevent all pressure backwards.

It would, however, be dangerous to remove all pressure from the retorts, since, in case of accident, atmospheric air might enter them in sufficient quantity to cause a serious and destructive explosion. The action of the Exhauster, therefore, requires to be accurately registered and placed under perfect control.

Hereafter we propose to discuss more fully the important functions of the Exhauster, and to indicate some of the ingenious improvements which have been made. Meanwhile we shall be glad to receive communications on the subject, and, we have no doubt that much valuable information on this and kindred topics is in the possession of observant practical men who, but for the facilities which this journal offers for the free expression of opinion, might have never taken pen in hand for the publication of their ideas.

THE PIONEER OF GAS-LIGHTING IN PHILADELPHIA.

In pursuance of our plan of publishing the names of the pioneers of gas-lighting throughout the United States, we have ascertained that to the late JAMES MCMURTRIE, of Philadelphia, belongs the high praise of originating that improvement in his native city. In the able report of JOHN C. CRESSON, Esq., Chief-Engineer of the Philadelphia City Gas-works, we find the following passage:

"A diligent search was made of the minutes of Councils, in relation to this subject, from the year 1795 down to the present time; and the first notice of gas was found to be in the following words:—'1815, Dec. 28. In Common Council.—A letter from James McMurtrie, on the subject of introducing gas-lights in the city, was received, read, and laid on the table.' That letter has been searched for among the records of the Councils, but could not be found."

This letter was referred to a "Select Committee," who laid it on the table, the proposition being opposed by a deep-rooted prejudice against gas-lights, which were not adopted until the year 1833.

PALMYRA. N. Y.—Our attention has been called to the price charged by this company, viz.: $3 50 per 1000 feet for rosin gas, while others charge $7; and we have ascertained that the meters used by this company measure by the 2000 feet, so that they get in fact $7 per 1000 feet, as do other rosin gas companies. Now, this is sharp-shooting, and not exactly "on the square." We shall alter their quotation in the tables to $7.

CORRESPONDENTS' COLUMN.

NEWARK, N. J. GAS-LIGHT CO.,
Jan'y 26, 1860.

Allow me to enquire, through the medium of the GAS-LIGHT JOURNAL, how we shall get clear of the deposit that is found in main gas-pipes, of a substance technically known as Napthaline, and what will prevent its formation and deposit?

Yours, &c.,
JOS. BATTIN, Engineer, &c.

FROM ONE OF THE "OFFENDED BRITISHERS."

——— GAS-WORKS, SCOTLAND,
Dec. 28. 1859.

I have been favored with several numbers of your very excellent and well-conducted JOURNAL. I like its spirit; it is generous and fair, and should the subsequent issues be conducted in the same gentlemanly spirit, I predict a very wide and extended support in this country. I am much pleased with it, and will remit my subscription to your bankers in London to-morrow. With this I enclose a few remarks which perhaps you will approve of, as it is a subject of considerable interest at this moment; and with sincere regards for the triumphant success of the AMERICAN GAS-LIGHT JOURNAL.

I remain, very truly yours,

We print the following letter verbatim:

EDITOR AMERICAN GAS-LIGHT JOURNAL.

Mister: I have got 2 sons, James Madison and Benjamin Franklin, SHEARS. George Washington died in his infancy. I hear you are a pretty smart man, and run a great paper. My boys are 14 and 16 respectively, and they've got some considerable gas into them and will make good gas men. Can't you take them into your Journal or put them into some gas-house. I am not much acquainted with the business, but they say it pays, and that's all I want. Write me what you can do for the boys. I see your paper every week. Yours,

THOMAS JEFFERSON SHEARS.

No date, no address; post-mark illegible, excepting O, which being translated, means, we suppose, Ohio. Well, then, Mr. Thomas Jefferson, James Madison, Benjamin Franklin, (and the late George Washington) Shears. we regret to say that we have no room for the little scissors; our work-box is full. If you see the JOURNAL every week it is more than we do. We "run" a great paper nevertheless.—ED.

ANSWERS TO CORRESPONDENTS.

L. S. W. of N. Y.—*Professor Wise says the best way to ascertain the quantity of gas contained in a balloon, is to give the gas company the globular diameter of the balloon; then, by multiplying the surface of the balloon by one-third of its radius, its cubic contents will be given.—Or, cube the diameter; and multiplying that by the decimal ·5236, it will also give the cubic contents. The diameter of the balloon may be found by measuring the breadth and counting the number of segments in the balloon at its equator. Again, by measuring the shadow of the balloon. after it is half-full and anchored to the earth. Out of all these processes you must manage to squeeze a reply to your question.*

X. A. of Ohio.—*We may quote from Bunsen the laws of the diffusion of gases; they are very interesting. You should own the work; it is but two or three dollars cost.*

Once more of Pa.—*The subject is run into the ground. If the volume of a simple gas. whose co-efficient is a, be twice absorbed by the same volume, h, of water at the same temperature but under two different pressures, P and P_1, the amount af gas absorbed in the two cases is:*

$$g = \frac{a\,P\,h}{0{\cdot}76} \quad \text{and} \quad g_1 = \frac{a\,P_1\,h}{0{\cdot}76}$$

Hence we have

$$\frac{g}{g_1} = \frac{P}{P_1}$$

So says Bunsen.

S. L. & Co. of Ga.—*We cannot state the value of wood-gas tar; it is not marketable here.*

A. D. of Conn.—*You are quite welcome to send your samples. Pre-pay the freight of course.*

Gas of Me.—*It is an extensive concern, that. The individual you allude to resembles a bushel of gas in a half-bushel bag, but being a* furriner, *we must overlook it, as we do.*

F. F. V. of Va.—*We take you from your initials, to be one of the "fustest families." Your application is on file. and will be submitted to the party wanting a superintendent. We have no particular objections to you for being a Virginian, nor will your notions be enquired into, if you can make good gas and mind your own business.*

State of N Y.—*The papers are received.*

L. of N. Y.—*The cost of a French patent is* $150.

E. R. S. of Mass.—*A governor is used only at the works.—The machine that you saw was probably a portable gasholder. Look out for these gas men; they are great quizzes.*

Pressure, of Md.—*Pressure of fluids consists of two kinds, elastic and non-elastic. Gas may be shut off as quickly as fluid; water should be closed at long heads more slowly.*

F. *But this is self-evident from its nature. Water is incompressible, and its force irresistible.*

T. D. of Me.—*Used-up air, as you call it, is heavy. Put your ventilators above and below. Take no rooms in the country as a guide; follow philosophy.*

S. F. of Ala.—*No.*

LIGHT, WATER and SEWERAGE PATENTS.

UNITED STATES.

26,595.—James M. Jay and John Darmer, of Canton, Ohio, for an Improved Apparatus for Heating Water;

We claim the combination and relative arrangement of the parts composing the water heater, substantially as and for the purpose set forth.

26,645.—James E. Boyle, of Brooklyn, N. Y., for an Improvement in Valves for Water-closets:

I claim combining with the body of the cock provided with the discharge pipe or nozzle, and having its cylindrical bore surrounded by an induction pipe. forming a surrounding chamber, with apertures in its bore, for the admission of water, as described, three piston valves on a movable stem, one above the discharge pipe and the other two below it, and bearing the relations to the series of apertures from the cylindrical bore in which they work, to the surrounding supply chamber, substantially such as described.

26,649.—James Calkins, of Hudson, N. Y., for an Improvement in the manufacture of Hydro-carbon Gas:

I claim attaching the eduction pipe of hydro-carbon blowers, chambers, pipes, flues, &c., for the purpose of heating the air after it leaves the blower or air chamber. and before it comes in contact with the hydro-carbon employed to produce light or heat.

26,686.—Moses W. Lester and Max Hjortsberg, of Chicago, Ill., for an Improvement in Apparatus for Heating and Ventilating Buildings:

We claim the arrangement of the ventilating pipes, F, extending down to the bottom of the furnace drum, B. and chimney flue, A, in combination with a furnace which is constructed with a central fire-box, K P L, radiating drum, H H G G I I O. and air-circulating and heating-chamber, extending up beyond the ventilating drum, in the manner and for the purposes described.

[This invention consists in combining with the heater or furnace an arrangement of vertical pipes, which lead from apartments and pass up through the furnace and communicate with the chimney piece. By this arrangement, while hot air is being introduced into apartments, cold or impure air is being drawn from the same. This appears to be a very good invention.]

26,696.—Albert Morehouse, of Farmer, N. Y., for an Improvement in the Gates of Water Wheels:

I claim the combination with the spout, 5, and with each other, of the gates, 6 and 7, inclined and arranged as described for the purposes set forth.

26,713.—Joseph Singer, of Cleveland, Ohio, for an Improved Hose Coupling:

I claim the adjustable ring, D, arms, E E, and eccentric levers, F F, in combination with the semi-circular strip, G, all applied and operating in the manner and for the purposes set forth.

26,739.—Franklin W. Willard, of New York City (assignor to E. G. Allen, of Boston, Mass.,) for an Improvement in Coal Retorts:

I claim, first, The construction of coal-oil retorts with internal false or extra heads at either end of the retort, and held at proper distances from the head proper by means of stays or studs, as described, the intervening space between each of the false heads and the end of the retort being filled with clay or other non-conducting material, substantially in the manner and for the purposes specified.

Second, The use of the circular plate, r, hung upon the false head, p, and operating as described.

26,749.—Lysander Button and Robert Blake, of Waterford, N. Y., for an Improved Hose Coupling:

We claim combining with the male and female parts, M and F, a closing pipe having an endwise motion through one of said parts, substantially as set forth.

26,767.—Thos. Houghton, of Philadelphia, Pa., for an Improvement in Lamps:

I claim the top of the ferrule, A, with its oval and inclined opening, in combination with the oval and inclined flange or projection of the cap, B; the said flange and opening being formed and adapted to each other substantially as and for the purposes set forth.

26,773.—Walter G. Mackay, of New York City, for an Improvement in Ventilating Sinks, Water-closets, &c.:

I claim the application of the ventilating pipe, A, at the upper bend of a bent pipe trap, and at its junction with the soil pipe, B, in combination with said trap and soil pipe, in the manner and for the purposes specified.

26,785.—George W. Robertson, of Philadelphia, Pa., for an Improvement in the Waste-cocks of Hydrants:

I claim causing the "waste water" of a hydrant, pave-washer, or other similar hydraulic apparatus, to wash the joint produced at the junction of the plug with the upper part of the barrel of the waste-cock thereof, substantially in the manner and for the purposes set forth and described.

26,793.—Samuel M. Smith and Caleb Winegar, of Union Springs, N. Y., for an Improvement in Drain Tile Machines:

We claim the relative arrangement for united operation of the screening box, B, tile making box, C, screening plunger, F, tile plunger, C, eccentrics d e, for operating said plungers, F G, pulverizing chamber, A. and feeding shaft D, substantially as and for the purposes set forth.

[With this arrangement, the operations of pulverizing, screening and molding the clay into tiles are performed in one machine, by a continuing revolution of the driving shaft; the pulverization occuring first, the screening second, and the moulding third. The pulverised clay empties into the screening box; from there it is forced through the screens into the middle box, and from these through the tile molds; the arrangement being such that, while clay is being screened at one end of the machine, pulverized clay is coming into the screening box at the other end, and screened clay is being forced out through the tile molds. This is a simple and perfect arrangement.]

26,795.—Samuel Squire, of Brooklyn, N. Y., for an Improvement in Hydrostatic Balances:

I claim the diaphragm, B, adjustable index scale, E, fluid column, C, and levers shown in Figs. 4 and 5, the whole constructed and arranged substantially as described.

26,826.—V. M. Baker, of Elkland, Pa, for an Improved Water Wheel:

I claim the combination of the two series of buckets, C, D, and scroll, E, constructed and arranged substantially as and for the purpose set forth.

[This invention relates to an improvement in that class of water wheels in which a scroll is employed, the wheel being encompassed by the same. The invention consists in a peculiar form and arrangement of the buckets, whereby several advantages are obtained over all scroll saws, to wit, a more uniform motion, and a better combined action of the direct and re-acting force or power of the water.]

26,866.—Kirdy Spencer, of Minneapolis, Minn., for an Improved Seat for Water-closets:

I claim the combination and arrangement of the slot, F F, with the projecting handles with straight and bent shanks, E and G. the bent plate G G', the combined groove, A A, formed by the rabbeting, B, in the front and the groove, A A, in the top, the plate, A, the panel, h h h h, the chamber, I, and the casement, F M, constructed in the manner described and represented, and for the purpose specified.

26,780.—John W. Wheeler, of Cleveland, Ohio, for an Improved Method of Elevating and Delivering Water from Wells:

I claim operating the valve in the bottom of the bucket by the rear end of the trough; the lever actuating tad trough being moved by the bucket, and the trough having a more rapid advance than the bucket, as set forth.

ENGLAND.

1,400.—Alfred Vincent Newton, of 66 Chancery Lane, London. Mechanical Draughtsman, for Improvements in Gas-Meters.

1,406.—Thomas Greenshields, of 11 Little Sichfield Street, London, for Improvements in Purifying Gas, and obtaining Ammoniacal and other Salts.

1,409.—Albert Fredrick Haas, of Camomile street, London, merchant, for Improvements in Lamps and Gas Shades, or Glasses.

1,410.—Francis Puls, Chemist, of Roxburg Terrace, Haverstock Hill, London, for Improvements in the treatments of Hydro-Carbons.

TREATISE ON THE MANUFACTURE OF GAS FOR ILLUMINATING AND HEATING.

BY MONS. A. LE ROUX, Civil Engineer, Director and Founder of *Le Journal de l'Eclairage au Gaz*, Paris.

The various treatises published in France upon the manufacture of gas, by Messrs. Peclet, Pelouze, d'Hurcourt and Magnier, have been of great service, but their publication was at dates so remote that their progress in the art of gas-making could hardly be foreseen by those authors. The only work of Mr. Samuel Clegg, whose loss to science is still felt, contains the most complete information upon making coal gas.

Nevertheless, Clegg's work perfect as it may be as regards coal gas, is still incomplete on the manufacture of gas in general, which ought, in certain cases and certain localities, to be advantageously employed. Above all, we believe it is impossible, in publishing a treatise on gas-making, to let people ignore the advantages which would result from the use of portable gas in connection with ordinary gas-works. These various considerations have induced us to undertake the publication of a new treatise on the "Manufacture of Gas for Lighting and Heating," which will include the manufacture of gas of coal, wood, and of mixed gas in general, as well as of portable gas.

We are not unconscious of the difficulties of the task which we have imposed upon ourselves, but we are encouraged by the promise of the assistance of several eminent engineers who have offered their aid, and which has decided us upon the undertaking.

Our treatise upon the manufacture of these gases will be divided into four parts. The first will comprise the manufacture of gas from coal, and the analysis of French, English, Belgian, German and American coals. The second will treat of portable gas, and of materials employed in its manufacture. The third, of water gas, of wood gas, and of mixed gas in general. The fourth will furnish a description of gas meters, of the photometric apparatus, of the apparatus for heating, and of burners and heaters (*brûleurs*).

The entire work will comprise twenty parts or numbers, composed of plates and text, at fifty cents each. The first number will appear as soon as five hundred subscriptions have been obtained. The subscription is payable in four parts; the first at the time of subscribing, and the other three parts every three months in advance.

Each subscription comprises the whole of the work, and implies the obligation to pay the amount at the times indicated.

Subscriptions are received at the office of *Le Journal de l'Eclairage au Gaz*, Paris; also of the *Journal fur Gasbeleuchtung*, Munich; and at the Rooms of the AMERICAN GAS-LIGHT JOURNAL, New York.

Just as we were going to press, the foregoing notice arrived in *Le Journal* of Dec. 20. We stopped the press to insert it, and being assured, from the high reputation of Mons. Le Roux, that the work will do service to the gas interests, we hope it will be responded to warmly.

THE GRIP ON THE GAS PIPES.—The ice had it all its own way the first week in January At a good many corners in the city bonfires were blazing in holes dug in the ground to thaw the pipes. We were eating frozen bread, and shivering out of reach of fires, but our gas-lights were in full blast, having Walton's apparatus at the rooms of the JOURNAL, and Gengembre's fluid in the metre at the house. This fluid of Gengembre's seems to add brilliancy to the flame, and we should think it desirable in summer as well as winter. Walton's apparatus should be attached to every lamp-post and every meter. Gas companies and consumers are referred to both advertisements.

COAL-TAR.

Among the chimeras whose pursuit has baffled the hopes and disappointed the ambition of inventors, none has proved more delusive than the manufacture of illuminating gas from coal-tar. The patient alchemists of mediæval times sought, it must be confessed with sufficient zeal, for some re-agent by which they might transmute the baser metals, and in these later days the problem of perpetual motion has found men bold enough to attempt its solution; and so we have a worthy trio of impossibilities. While coal tar is known, however, to be useless as a gas-producing material, the *rationale* by which this conclusion is reached, and the frequent attempts and as frequent failures which render it inevitable, are less generally familiar. A brief sketch of past labors in this most unproductive field will best afford an unalterable negation to the query—Can coal-tar be profitably employed as a material in the manufacture of illuminating gas?

Among the first, and by far the most persevering of the engineers who have attempted to distil tar into gas, was Mr. George Lowe. Some sixty retorts were set upon his plan at the works of the Chartered Gas Company, London, and every advantage that a varied experience and careful manipulation could secure, undoubtedly attached to the trial there made; but (to use Mr. Lowe's own words) "the extra cost for fuel, labor, and wear and tear, put the extinguisher upon it in about twelve months." Although this experiment was made in 1822, the testimony of Mr. Lowe and his employées is fortunately upon record, and serves to afford some idea of its enormous practical difficulties. Reference will be had to this testimony, in a subsequent portion of this article.

Undeterred by the failure of Mr. Lowe's attempt, and by the unpromising facts which it served to elicit, the inventors of England, as the records of the English Patent Office prove, were in no way satisfied that, because the thing had not been, it could not be, done.—Every conceivable device was suggested; alterations, at one time the most trivial, at another the most radical, were made in every detail of the retort and its connections; every possible condition of distillation was tried; and yet the failure of each in succession proved all to be alike deficient in that great pre-requisite to success—possibility.

For nearly thirty years this spasmodic waste of ingenuity went on, and during the year 1850 a patent was issued to Messrs. Laming and Evans for "improvement in distilling coal tar and similar substances." Their apparatus (a sort of double retort, one or both chambers of which were to be filled with coke) was thoroughly tried, and emphatically condemned at the Westminster station of the Chartered Gas Company.

Another patent, dated the same year, was obtained by Mr. George Michiels, who similarly proposed to carbonize the inferior gas evolved from coal during its later hours of distillation, by means of tar gas. His patent claims (specification 2), the passing the vapors of coal-tar through independent heated vessels, not unlike Malam's regenerators, before admixing them with the coal gas. The results of a trial of his process at the Vauxhall station of the London Gas Company were precisely similar to those obtained at the Chartered Company's Works nearly thirty years before.

In 1852, we again find works built at Newport, Isle of Wight, by a French engineer, named Danré, for manufacturing the combined gases from coal tar and coal.—The process then adopted was substantially the same as that of Mr. Michiels, but at Newport the vapors of coal tar were passed primarily through cellular divisions in the retort itself, instead of through separate heated vessels. Great stress was laid upon the device of syphoning the coal tar into the retorts direct from the Hydraulic main, to which was attached an auxiliary condenser for each retort. This idea was adopted from the now obsolete manufacture of oil gas, and wonderful virtue was to attend the thus keeping the coal-tar from contact with atmospheric oxygen. It was found in practice, however, that the cellular divisions of the retorts choked so rapidly with carbonaceous deposit, as to lead to a change in the retort about a year after the construction of the works; and a host of attendant practical difficulties soon after led to the abandonment of the whole scheme.

In spite of trials thus publicly made and avowedly unsuccessful, and notwithstanding the eloquent fact that numberless patents upon the subject had fallen still-born, it was reserved for Mr. Henry W. Adams, of this city, to claim the dubious honor of being the last and most pertinacious advocate of the light-giving advantages and economical production of tar-gas. In fact a corporation bearing the sonorous and taking title of the "New York Mutual-Saving Gas-Light Company," was organized to work Mr. Adams' so-called patent, and the Report of Proceedings before the Common Council, when the said N. Y. M. S. G. L. Co. applied for permission to open the streets, embodies an explicit condemnation of his hobby, as well as of the most equivocal chemical, mathematical and mechanical attainments, which were ever intended to serve as an inventor's sheet anchor. The *brochure* in which he sets forth his scheme reads like the report of some scientific society in Laputa; and his averages of specific gravities, his elucidation of novel principles in chemistry, his mode of jointing pipes, his registry of gas to public lamps, and his lighting the harbor and shipping, sufficiently recommend themselves to the perusal of all who wish to "laugh and grow fat."

Thus much says History, and her warning is plain, practical, and conclusive.

One fallacious motive for distilling tar has been an idea that its gas-product possesses a very high illuminating value. Now, how stands the record upon this point? We learn from the very highest authority in gasometric chemistry, that while 50 cubic feet of gas (instead of 10, as recently stated), are obtainable *on a small scale*, from each gallon of coal-tar distilled, its illuminating value is equal to only 10 sperm candles of 120 grains per hour, for every 5 feet of gas consumed. It is doubtful whether any gas-maker would be willing to send out a gas of so poor a quality, while it is certain that nothing but the most unfortunate circumstances of situation, as to coal-supply, would excuse his doing so. It is unquestionable that the soot or finely-divided carbon which finds its way to the burners, when tar is used as a gas producer, cannot be separated by any of the ordinary chemical or mechanical devices of purification, and that the not uncommon practice of re-distilling the tarry scrapings of the mouth-piece is therefore, to a degree, injurious to coal gas. And further, it may be observed, that the greater part of the sulphur which is contained in coal is carried off in the tar, any attempt to distil which must, from its very nature, involve excessive expense for purification.

A great desideratum for gas-making is to reduce the amount of coal-tar produced, to its minimum. In the manufacture of photogenic oils from coal a low heat gives large condensible and small gaseous product; and in gas-making the converse of this holds good. *High heats and rapid distillation* reduce the yield of tar; but both must go together, or the illuminating value of the gas-product suffers. Hence the advantage of working retorts of large horizontal surface at high heats, and charging frequently with comparatively small weights of coal.

But what is the testimony of those men who, in the coal tar mania, have borne "the heat and burthen of the day?" What do they say of the more immediate and practical obstacles to the distillation of tar? They tell us that, in working the tar benches, they found it a matter of enormous difficulty to keep up the heats; that the retorts burned out where the tar was syphoned in; and that no interposition of coke, of brickbats, nor of any dispersing material whatever, served to remedy this trouble. They speak feelingly of the chokage of the stand-pipes, and describe in graphic terms the removal of the retort-covers two or three times during each charge, and the vast volumes of smoke and sulphurous gases which made the use of the "jumper" a task for devils rather than for men. They inform us that the delicate appliances of sledge-hammers and cutting bars were necessary to remove the agglutinated coke which, when thus excavated from the retorts, was simply a bituminous monstrosity, valueless as fuel, and unsaleable at any price.

There is a world of sound doctrine for the magnificent theorists who would invest coal-tar with the halo of their sophistries, in the unbiased verdict of these working men; and that the statement of these last are irrefragably true, is best evidenced by the fact that no engineer of ordinary education, intelligence and study, can so far stultify himself as to assail them. "*Non cuivis ligno fit Mercurius*" is as true now as ever, and the English paraphrase of this proverb is as pithy and homely, aye and as true a bit of good old Saxon, as was ever stamped with popular approval. It cannot be done, and yet we hear men talk as gravely of distilling tar, as if this El Dorado *at a distance*, were not a very Slough of Despond in reality. It is time that an end were put to the promulgation of a heresy so offensive to the stern records of history, so arrantly absurd upon its face, so very a cheat, delusion and snare. And if the scanty and scattered remnant who blindly hug this phantom, would but read diligently, their present dim imaginings would give place to a serious conviction of the uselessness of coal tar as a gas-producing material. It is a topic which does not possess sufficient dignity to call for argument, nor is it to the purpose to adopt it.

Let *facts*, plain, unmistakeable, eloquent *facts* be consulted, and tar-gas will be mentioned only as a delusion which has had its day, like the other ephemeræ which we find in science as well as in nature. In conclusion, the temptation to quote from the author of the "Chemistry of Gas-Lighting" is irresistible:

"For more than thirty years coal-tar has been twisted "and tortured in everyway, to give up its latent store of "gaseous luminosity. It has been distilled at high heats, "and at low heats; with steam and without steam; with "coke and without coke; with the wholly-spent charge "of coal and with the half-spent charge; with iron wires, "hoops and chains; with scrap iron, charcoal, coals, "brickbats, lime and clay; and in fact with everything "at all likely to assist in its decomposition, and give rise "to that all desired conclusion—the economical produc-"tion of illuminating gas. At length we find, after an "enormous expenditure of time, talent and money, that "practically the thing cannot be done to pay—conse-"quently it cannot 'be done at all.'"

In the Report of the Committee on Lamps and Gas, in favor of permitting the New York Mutual-Saving Gas-Light Company to lay pipes through the streets and avenues of the city of New York (Board of Aldermen, Doc. No. 11, March 14, 1853), is the following detailed description of Professor Adams' process of manufacturing gas.

"The improvement in the manufacture of coal-gas, which the New York Mutual-Saving Gas-light Company is now prepared to introduce to the public, was made by Professor Henry W. Adams, A. M., of the city of New York. A patent for this remarkable invention, prepared with great legal ability, was issued by the United States Patent Office, on the 10th day of August, 1852.

"Two old and well known and thoroughly tested processes throughout the world, for making gas, to wit, coal-gas and oil-gas, are so put together as to involve the expense of one only, and yet secure the results of both; in addition to which the coal-tar, now a waste product, is all used up, and turned into gas, without any expense. The whole process is exceedingly simple, and yet of immense practical use and value. One ton of coal, of two thousand two hundred and forty pounds, of ordinary quality for gas-making, produces, by the present mode of making coal-gas, nine thousand two hundred cubic feet, and one hundred and ninety pounds of coal-tar on a distillation of four hours, having a specific gravity of 421 one thousandth, compared with atmospheric gravity. This coal tar is now a waste product, but yet is the *very essence of light*, of the richest quality, and will make gas at the rate of twelve cubic feet per pound, and of specific gravity 96-hundreths. There remains, also, in the coal, after a distillation of four hours, one thousand nine hundred and twenty cubic feet, which is too poor in carbon to be saved and incorporated into the contents of the gas-holder.

"That quantity, for the want of *more carbon*, is left in the coke which is discharged from the retort, after a distillation of four hours. But by Prosessor Adams' process, this one thousand nine hundred and twenty cubic feet per ton of coal, is *enriched in carbon* by the decomposition of coal-tar, oil, resin, asphaltum, mineral-tar, grease, or any other proper bituminous or carbonaceous substances, conjunctively with the distillation of the coal, in the same retort, by the use of the same heat, and in such increasing quantities, during each hour, as shall keep pace with the decreasing quantity and deteriorating quality of gas given off by the coal during each successive hour of the distillation.

"If the *coal-tar alone*, which is produced from one ton of coal, of two thousand two hundred and forty pounds, be fed into the retort, in the manner prescribed by Professor Adams, conjunctively with the distillation of a ton of coal, and the distillation be continued six hours, there will be added four thousand two hundred cubic feet of gas to the quantity which is now produced at the coal-gas works in this country and Europe. The present product from two thousand two hundred and forty pounds of coal, on a distillation of four hours, is nine thousand two hundred cubic feet of gas, of specific gravity 421 one thousandths; but by Professor Adams' process, the product from the same quantity of coal amounts, on a distillation of six hours, to thirteen thousand four hundred feet, of specific gravity 519 one thousandths.

"This is accomplished by saving the one thousand nine hundred and twenty feet, which remains in the coal after a distillation of four hours, as now practised, and enriching it in carbon by the decomposition of the one hundred and ninety pounds of coal tar in the same retort, during the last hours of the distillation of the coal. Besides, Professor Adams can feed into the retort, during this period, additional quantities of coal-tar, oil, resin, asphaltum, grease, mineral-tar, or any other proper bituminous and carbonaceous substances, and thus greatly increase the quantity and quality of gas during the same period of time, without any additional expense except the cost of such fluid substance. By this process, therefore, the New York Mutual-Saving Gas-light Company can manufacture gas *much faster, much cheaper, and much more brilliant*, because richer in carbon, than any other gas company in the world.

"This great result has been attained by Professor Adams, as the fruit of indefatigable researches and experiments in this branch of manufacture, and may be relied upon by the public."

In spite of the favorable report, and a powerful lobby influence, the company failed to obtain the privileges asked for, and therefore caved in.

A CASE FOR IRON FOUNDERS TO LOOK INTO.

A man named Curran has lain in the Eldridge street jail for three or four months past, on a charge of embezzlement made by a man named Elston, his former employer. Curran was first tried on a criminal charge and acquitted.

When the matter came up before the judge of the Supreme Court, on a motion to reduce his bail, Curran put in an affidavit denying the charge and stating that he had been offered his liberty if he would leave the business, or return to the service of his first employer, who is a dealer in foundry facings. This proposition Curran had the pluck to refuse, and consequently he lies in prison. His wife, a most estimable woman, and three helpless children, were driven to destitution, until the case was brought to our knowledge by the keeper of the prison, who considered it a case of oppression. As to Curran's guilt or innocence, we have no means of judging; but our personal examination of other features of the case have satisfied us that it would be expedient for iron founders who have occasion to buy their facings in this city to enquire into this affair, and perhaps they will get a clue to some of the secrets of the trade. Another man is mixed up in the matter, as witness for the plaintiff. The stories of both sides might as well be heard, and it will not take a Philadelphia lawyer to decide whether the honesty (if there be any) is all on one side.

STREET LANTERNS.—Mr. A. C. Parry, whose lanterns will attract the notice of readers, received a diploma for the best lantern at the Ohio Mechanics' Institute Exhibition of 1852, and a bronze medal at the Exhibition of 1857.

NEW ROOMS OF THE AMERICAN GAS-LIGHT JOURNAL.

On the last page will be found a view of the Iron Buildings, Nos. 254, 256, 258 and 260 Canal street, East, a portion of which we have leased for the purposes of this JOURNAL.

These buildings were erected by GEORGE BRUCE, ESQ., some five years ago, at the widening of Canal street, supposing that they would be brought into immediate requisition by the demands of trade in its progress towards the centre of the island. They are of imposing appearance, covering an area of about 100 feet square, well built, and admirably arranged for a heavy and general business.

CHARLES SCOTT & CO.'S WAREROOMS.

But the subsequent widening of Reade and Duane streets, and the erection of the marble palaces on Broadway and several cross streets below this point, retarded the upward progress of the heavier establishments, so that these buildings remained unoccupied until within a year or two, when they were leased by Messrs. CHARLES SCOTT & Co., Importers of Scotch Muslins, who occupy the upper part of Nos. 254 and 256. Messrs. Scott & Co., being natives of Scotland, and purchasing the goods in person, direct from the factories, without the intervention of middle-men, are enabled to sell at lower prices than most other houses in their trade. We would, therefore, take this opportunity to recommend them to Western and Southern buyers, as being enabled to present large assortments and the newest style of every description of fabrics in their particular line, on favorable terms.

RICHARDSON, BOYNTON & CO.

The building towards Broadway, No. 260, is occupied by two large establishments. On the ground floor is the old and well known firm of RICHARDSON, BOYNTON & Co., manufacturers of and dealers in Stoves, Furnaces, and Ventilating Apparatus. The reputation of this house is established throughout the country, and it is but necessary to remind buyers of their whereabouts, to insure them a good trade in the spring.

WEST CASTLETON SLATE COMPANY.

Occupying the floor above, at No. 260, is the WEST CASTLETON SLATE COMPANY, U. R. Hitchcock agent, in whose warerooms are beautiful Mantel-pieces richly veined, in imitation of, but even more natural than the original marble. This slate is tough, and retains the colors applied to it, without fading; and the relative cost of its manufacture, and those of marble, is about eighty per cent. in favor of the slate.

ROOMS OF THE AMERICAN GAS-LIGHT JOURNAL.

The Rooms of the AMERICAN GAS-LIGHT JOURNAL embrace the entire first floor and basement of Nos. 254 and 256 Canal street, and 104 and 106 Elm street. Owing to an existing lease of No. 256, possession of that part cannot be had until 1st of May. When both rooms are obtained the premises will measure 50 feet front on Canal street, by nearly 100 feet on Elm street.

Fronting the north, with a fine easterly exposure, on a street 150 feet in width extending from the North or Hudson River, with a slight curve at Division street, through to the East River, within a block of Broadway, and the same distance from the Harlem railroad cars at Centre street, and quite near the Bowery, the position of our new Rooms, so central, so airy, spacious and light cannot fail to prove convenient to our friends, as they are admirably adapted to promote the objects and interests of this JOURNAL.

GROUND FLOOR.

On the ground floor of No. 254, at the right on entering, is the Banking and Collection Department. At the extreme end are the Subscription and Advertising desks of the JOURNAL.

On either side of the Room are desks for officers of gas-works, visitors, the editors, reporters and designers, and shelves filled with show gas-meters, gas-holders and many other kinds of gas apparatus. A double gallery has also been erected, containing twenty different gas-burners; so that visitors can see all the kinds that are in use. Six chandeliers hang from the ceiling, which are lighted and extinguished instantaneously by Gardiner's electric apparatus. The ceilings of these Rooms are fifteen feet high.

FRANKLIN'S PRINTING PRESS.

In the centre of the Rooms is a curious old relic, the printing press at which BENJAMIN FRANKLIN worked as pressman, when but fourteen years of age, in the office of his brother, James Franklin, in Boston, Mass., publisher of the *New England Courant*, the second newspaper published in America. James published something offensive to the General Assembly of Massachusetts, who arrested and imprisoned him, and forbade his publishing that paper any more. It was continued for a short time afterwards by BENJAMIN FRANKLIN, and we have a copy of the first number issued by him; it is dated February 4–11, 1723, contains two pages, and measures 7 by 10. inches. He alludes to the censorship of the Assembly in sarcastic terms. We procured this old press in Newport, R. I., last summer, and may allude to it again hereafter. It is supposed to have been built in London in 1650, and was brought over in 1717. We also own the press at which FRANKLIN worked at Watt's printing house, near Lincoln's Inn Fields, London, in 1724–5. This press was presented to us by Messrs. Harrild & Sons, of London, in 1841, and is now in the Patent Office at Washington, for safe keeping. But to return:

STREET VIEW.

The scene in the street gives an idea of the activity in front of our Rooms on post-day, when our mails are despatched for England, Scotland, Ireland, France and the continent of Europe, and for California, Oregon, South and Central America, and Cuba; also for the thirty-three states of this glorious Union.

The crowd passing in and out, purchasing and reading the JOURNAL, depositing letters in the Gas-light Mail-stations, anxiously studying the Bulletin, where is to be found at all times the latest news, gives a lively aspect to the scene.

Broadway can be distinguished by the omnibuses passing up and down, and its proximity to the Rooms is thus appreciated.

Half a mile down Canal street, beyond Broadway is the North or Hudson River, where the steamers are ready, steam up, to depart for their respective ports. Half a mile or more down Broadway, in an old ruined church, called LETTER-BOX ABBEY, is the City Post-office, where the mails are made up daily for every quarter of this vast continent. It is to these various points that our mail-wagons are flying with their loads.

BASEMENT.

The basement floor is of the same size as that above excepting that the ceiling is but ten feet high. The floor is well paved with brick. Seven divisions are separated by iron columns, and numbered 1 to 7, for the erection of benches of iron and clay retorts to exhibit to visitors who may wish to see the various kinds. Many other kinds of heavy apparatus will be added to this department.

VAULTS.

Passing through glass doors, from the basement, is a long corridor of vaults under the sidewalk, well lighted and well paved, containg samples of cast iron gas and water pipe, retort lids and furnace doors, coke-barrows, coal-scoops, vitrified drain pipes, certain printed works on gas-lighting, and other heavy goods. These are also arranged in divisions numbered from 8 to 20. Over each division is a conspicuous sign with the name and address of the manufacturer.

HOURS OF BUSINESS.

The Rooms of the AMERICAN GAS-LIGHT JOURNAL will be open at all seasons of the year, from seven o'clock, A. M., until dark, during which hours the public can visit them and inspect everything within their walls. Porters are in attendance to exhibit and give all information respecting the samples. Of course we take on exhibition samples from our advertisers only, for it is their interests that we ought, and desire to promote. We are not content with merely pocketing the money of advertisers; we wish to see them profit by their liberality to us, and what is more, we intend that they shall.

PHOTOGRAPHIC VIEWS OF GAS-WORKS.

John C. Cresson, Esq., Chief-Engineer of the Philadelphia Gas-works, has presented us with several beautiful photographic views of the new works, retort-house, meter-house, &c., at Point Breeze. These are framed, and adorn our walls, and we will be grateful for views of any and all other gas-works, and of water-works, either in this country, Great Britain, or other countries, all of which shall be framed and hung up. A collection of this kind will be interesting to all who see them. We have seen several exquisite views of British water-works in this country.

PHOTOGRAPHIC PORTRAITS.

We are also collecting a gallery of photographs of officers of gas and water works, and entreat them not to be too modest to send their portraits to us. We have gotten one of Mr. Roome (no matter how), without his knowledge, and as we have begun with one of the best-looking, no one else should hesitate to join his company. Our friends may be sure that we are not collecting another Rogues' Gallery, after that of the Police Department, because we shall not admit the likeness of any member of the city council.

LIBRARY.

The book-cases will contain all the works on gas-making, water-supply and sewerage, that can be procured in any country; also the charters and reports of all companies, and of all municipal departments, both here and in Europe, that will serve to complete the record or instruct the enquirer.

From this brief description a general idea may be formed of the nature of our plans, which are not yet matured of course, but are in process of perfection. For any suggestions, or contributions, we will return our grateful acknowledgments.

GAS-WORKS IN CONSTANTINOPLE.

There are two gas-works in Constantinople both of which are on the European side of the city, erected by Mr. James Crawford. The first was erected in 1848, for the purpose of lighting the Sultan's palace, mosques, &c., at a place called Chregan, about three miles from the city. The works consisted of 14 D-shaped iron retorts 12 x 12, and 7 feet long; in seven ovens of two retorts each, condensers, washers, dry-lime purifiers, and two gas-holders to contain 6,500 cubic feet each. In 1854 the new palace of the Sultan, which had been in course of building at Dolma Baktchie (garden in the valley) a few years previous, was advancing towards completion, and from its inordinary extent, the authorities considered it expedient to have a large gas-work erected to meet the demands. The site was chosen at the distance of 600 yards from the palace, and within one mile of the city, and fully two miles from the former gas-work. This work was put in operation on the end of 1854, and completed at he end of 1855. It consisted of 42 D-shaped iron and clay retorts, 12, x 14, feet long in 14 ovens of 3 retorts each, and 7 gas-holders, dry lime purifiers, station meter, and three gas-holders, to contain in all 51.000 cubic feet of gas. All of the apparatus was mde in England, and of modern construction. In 1856 an English company was formed with a view of illuminating Constantinople and other towns of European Turkey, with gas, who made an appeal to the Sultan, declaring their intentions and requested his concession to proceed, the intelligence of which aroused the Turkish authorities themselves to action, although it was an enterprise they had never before contemplated; however they at once proceeded with a 12 inch main pipe up the hill into the main street of Pera, now called the Grand Rue, (a height of about 350 feet above the level of the works), along which the 12 inch main was laid about half way, placing branches opposite to each projecting street, and, at the same time, erecting lamps upon cast iron brackets, attached by bolts to the front of the shops, dwellings, &c.,—30 yards distant—the streets being much too narrow to admit of lamp posts. A ten inch main was then added to the twelve inch, and proceeded with in like manner for a short distance, and finally in 1857 an eight inch main was attached and carried down the hill on the other side to Galata, (shipping quarter) which is of about the level of the gas-works. This completed a main reduced from 12 to 8 inches of nearly three miles in length, and forming almost a semicircle; mains, varying in size from eight to two inches were also laid down for a short distance in most of the projecting streets. At the same time a number of English gas-fitters were busily engaged in the fitting up of private dwellings, shops, and public lamps.

In September, 1857, I was engaged for the erection of a new and third work, for the city supply alone; during the end of that year, and early in 1858, several pieces of ground were surveyed, which the authorities intended purchasing for the erection of such works, but they were subsequently deemed too expensive, hence it was considered better only to extend their old works; therefore the small work at Chregan had the floor and furnaces lowered, and placed three retorts in each oven, which made 21 in number instead of 14; and to maintain their constant charging during the day, the surplus gas was passed through the mains into a gas-holder at Dolma Baktchie work, which was kept low in pressure for the purpose of securing it. The retort-house of the Dolma Baktchè work was extended only so as to admit of about 100 retorts, as follows: a bench for eight new ovens of three retorts each were to be added to the end of the fourteen old ovens, which would make 66 retorts in a breast; the new portion of the house being double, a separate bench of six ovens was to be erected to contain five retorts in each, which would make in all 96 Retorts of the one and 21 of the other—117 retorts.

These benches were in course of erection, but could not be completed for want of money; and one gas-holder, to contain 125.000 cubic feet of gas was made, fitted and marked in 1857-8, but they were unable to furnish for it a tank; also four 12 feet square dry lime purifiers, two of which were fitted and jointed, the other two they were unable to complete.

The authorities also purposed laying an additional 12 inch main pipe from the works along the water side for the purpose of lighting Galata and the lower extremities of Pera, by which they would be able to maintain a uniform pressure throughout, but this they were also unable ro put into execution.

Such a state of financial affairs as a matter of course put an end to any rapid extension in the city. At the end of 1858 all of the English gas-fitters and pipe-layers were dispensed with, and the work resumed by a number of Turkish boys, varying in age from 14 to 18 years, who had only acted as scudgies, for a few months to the English gas-fitters.

The inhabitants now deeply express their dissatisfaction at the inefficient manner in which their gas-fittings are executed. One-seventh part only of that large and thickly populated city is lighted with gas, the rest remains in darkness. The inhabitants of the latter districts have now to be contented with but a faint hope of ever enjoying that "brilliant lamp" which would, in a great measure, constitute to them a feeling of safety amongst such swarms of felonious robbers, especially as these base assassins stab in the dark. There are about 1,500 consumers by meter in the city (wet and dry) and 320 public lamps, the average consumption of gas per month by these is about 1,300,000 cubic feet—quantity demanded about 8,000,000 cubic feet per month, consumption per month at palaces, mosques, &c., 750,000 cubic feet. There are in all about 12 miles of main pipe laid down, of this one-half is in connection with the palaces, &c.

The gas is made from New-Castle coal, the price of which there, runs from 27s. to 32s. ($6.50 to $7.68) per ton. The price of the gas per 1,000 is 75 piastres, value in English 10s. or more, according to the exchange—about $2.50.

Such was the progress and actual state of the works when I left Constantinople in May last, and in a letter which I received from Mr. James Crawford a few days ago, he informed me that everything remained in about the same condition.

J. H.

——— Gas Works, Scotland, 1860.

LAVA BURNERS.—Professors Hayes & Jackson, of Boston certify that these burners resist entirely the action of heat, cold, acids and alkalies, and they are of course not liable to rust or corrosion. This is a great recommendation certainly. This burner question we promise to ventilate thoroughly as we proceed.

KENNEDY'S WATER-METER is advertised in this numbrr, and we have one of them attached to the Croton service pipe in our basement. The attention of water companies is called to this meter as the first brought thus prominently before the American public. The agent, Mr. McKEAN, is anxious that it should be thoroughly tested, feeling satisfied that it will prove entirely accurate.

THE IMMERSED MULTITUBULAR CONDENSER.

Since the article on condensation, which appeared in the last number of the AMERICAN GAS-LIGHT JOURNAL was written, its author has been favored with a tracing, and description of an improved form of multitubular condenser, in which the comparatively minute ducts are immersed in water.

It is believed that this form of condenser is more steady, uniform, and manageable in its action than any other yet made public, and that a record of its distinctive features will prove a fitting pendant to the preceding article.

The characteristic modesty of its inventor alone prevents the rendering of "honor where honor is due," but, after all, the mention of his name, eminent as it is in the profession, would neither enhance nor detract from the eulogy which an examination of his condenser will secure for it.

The apparatus may be described, from the abovementioned tracing, as follows: The inlet to the condenser is an 18-inch pipe, while the condensing series is composed of 240 4-inch pipes, each 11 feet 6 inches long, rising vertically from the lower sealing-box through the water contained in the tank of immersion. Considering each set of 24 pipes as a single multitubular duct, we find 10 of these ducts joined in alternate pairs, at top by a water-lute and cover similar to that of the dry Lime Purifyer, and at bottom by a sealing box with the ordinary partition plates running traversely to its length, and dipping into the tarry and ammoniacal products of condensation. The lower box is 30 ft. by 8 ins. long, by 5 ft. 3 ins. wide over all, and is provided with the usual tar-overflower, and with hand-holes at proper points for cleansing. The top plate of the lower box is 1 ½ ins. thick, and forms the bottom of the water-tank, the sides of which suitably decorated with exterior mouldings are bolted to the lower box, and thus completely surround the lower vertical pipes. At one end of the tank is a pipe for the admission of the cool water, and, at the other end, a similar pipe for the eduction of the water after it shall have absorbed the excess of heat from the gas, and so have reduced it to its required temperature.

It will be observed that, owing to the manner in which the small ducts are connected at top, by simply removing the covers they are all exposed and rendered accessible for cleansing.

The gas, entering the lower box is immediately separated into 24 small columns, each of which is surrounded by water, and in this minutely divided state it traverses the condenser, losing heat steadily, and sending out, be it winter or summer, an unvarying stream of condensed products through the tar-overflow.

By graduating the supply of water to the tank, and observing a thermometer placed at the outlet of the condenser, any temperature above that of the inflowing water can be preserved, and in winter, gas, so far as the condenser is concerned, can be at all times protected from the ruinous effects of a temperature, not far above, or it may be a trifle *below*, Zero.

Economy of space is also a noticeable feature of the proposed Condenser, occupying only 161 square feet of ground room, yet comprising 240 four-inch tubes, each 11 ft. 6 ins. long, thus affording about 3000 feet of condensing superfices. This would, if measured by the rule for atmospheric condensers, suffice for the complete condensation of 20,000 cubic feet per hour, but such a system of immersed tubes will manifestly ensure vastly increased efficiency, and when of the dimensions and arrangement given, will in practice be found to have a normal power of at least 40,000 cubic feet per hour.

In estimating the peculiar merits of the condenser, for which the caption of this article will furnish an appropriate name, let engineers compare it with Wright's Ventilating Condenser, confessedly the most perfect of its kind. In this latter form of apparatus we find that at the temperature of the air its power ceases, and certain it is, even in New York, where the Mercury ranges to 100° F. in the shade in summer, and to 20° F. in winter, that atmospheric vicissitudes are too violent to render advisable any more 'Air' Condensers.

Even in London it is a not uncommon practice to inject steam into the condenser, with a view of raising its temperature, in connection with which practice, by the way, a lamentable accident occurred at the works of the "Equitable" Gas Company, in February, 1855.

In the case of water, however, it will be remembered that 32° F. is the lowest point consistent with its fluidity, while in summer it never approximates closely to the temperature of the air. Hence every one must admit that water, with a maximum theomal range, of say, 45° F. is far superior as a condensing medium to air, which similarly varies 120° F. even without considering its vastly superior capacity for heat.

Sufficient has been said of this Condenser to supply the information as to its construction, which must serve to influence the opinion of the profession, and closing this *Postscriptum* to a previous essay, their author regrets the implied obligation which renders indelicate any present identification of the designs of the "Immersed Multitubular Condenser."

The relative effects of water and air, as cooling agents for the condensation of gas, have been determined experimentally by PEOLET to be as follows:

Excess of temperture in the gas.	Quantity of heat lost by a square unit of exterior pipe surface.	
	When radiating in air.	When plunged in water.
For an excess of 10°	8	88
" " 20°	18	266
" " 30°	29	5353
" " 40°	40	8944
" " 50°	53	13437

(Clegg, 3d edition, page 182.)

The superiority of water as a condensing agent is clearly manifested in the above table.—ED.

CANAL STREET TO BE THE NEXT WALL ST.

A month's experience in this fine wide business thoroughfare has convinced us that within a few years Wall street will be quite played out, and the bulk of the financial business of the city will be centred in or near Canal street.

The great mass of the dry goods and hardware business is now located above the Astor House, and it is rapidly moving up still higher.

Canal street is already much frequented, owing to the large manufacturing interests now in it, and to the New York Gas-light Company's office being so near, in Centre street, as well as to the fashionable dry goods establishments which hug its corners west of Broadway. Devlin is said to have purchased the French Catholic church opposite the rooms of the AMERICAN GAS-LIGHT JOURNAL, on which he will shortly proceed to erect a magnificent clothing establishment; and then the banks will drift up and slip quietly alongside these customers of theirs, whose loss they are already beginning to feel.

At this moment, of fifty-five banks in the city of New York forty-two are out of and above Wall street, as follows:

Banks.	In Wall street.	Out of Wall st.
1 American Exchange		5 000,000
2 Artizans'		600,000
3 Atlantic		400,000
4 Bank of America	3,000,000	
5 Bank of Commerce		10,000,000
6 Bank of New York	2,800,000	
7 Bank of North America	1,000,000	
8 Bank of the Commonwealth		750,000
9 Bank of the Republic		2,000,000
10 Bank of the State of N. Y.		2,000,000
11 Broadway		1,000,000
12 Bull's Head		173,300
13 Butchers and Drovers'		800,000
14 Chatham		450,000
15 Chemical*		300,000
16 Citizens'		400,000
17 City	1,000,000	
18 Continental		2,000,000
19 Corn Exchange		1,000,000
20 Dry Dock		420,000
21 East River		206,525
22 Fulton		600,000
23 Greenwich		200,000
24 Grocers'		300,000
25 Hanover		1,000,000
26 Irving		500,000
27 Importers and Traders'		1,500,000
28 Leather Manufacturers'		600,000
29 Manhattan	2,050,000	
30 Manufacturers & Merchants'		600,000
31 Marine	500,000	
32 Market		1,000,000
33 Mechanics'	2,000,000	
34 Do. Banking Association	316,000	
35 Mechanics and Traders'		400,000
36 Mercantile		1,000,000
37 Merchants'	2 700,000	
38 Merchants' Exchange		1,235,000
39 Metropolitan		4,000,000
40 Nassau		1,000,000
41 National	1,500,000	
42 New York County		200,000
43 Do. Exchange		130,000
44 North River		316 000
45 Ocean		1,000,000
46 Oriental		300,000
47 Pacific		422,700
48 Park		2,000,000
49 People's		412,500
50 Phenix	1,800,000	
51 St. Nicholas	750,000	
52 Seventh Ward		500,000
53 Shoe and Leather		1,500,000
54 Tradesmen's		800,000
55 Union	1,500,000	
Thirteen banks in Wall st.,	$20,916,000	
Forty-two banks out of Wall st.,		$49,016,025
		20,916,000
Aggregate banking capital of New York,		$69,932,025

It will be thus seen that the step we have taken, in a financial point of view, is not an unwise one. Our collections and banking interests are already on the increase-

* The regular dividends of this bank are 24 per cent. per annum; its capital is small but its average deposits are $2,000,000, on which it pays no interest. None of the Wall street banks can approach this. By hard scratching and encroaching upon their surplus they squeeze out six to eight per cent. per annum dividends.

SCIENTIFIC STAFF OF THE AMERICAN GASLIGHT JOURNAL.

We have the pleasure to announce that the following scientific gentlemen will be contributors to the AMERICAN GAS-LIGHT JOURNAL:

Professor W. E. A. AIKIN, Professor of Chemistry in the University of Maryland, Baltimore.

Professor THOS. ANTISELL, Professor of Chemistry, in the Medical Department of Georgetown, D. C. College.

CHARLES T. CHESTER, Electrician, on subjects connected with gas-lighting by the electric spark.

Professor JAMES R. CHILTON, Analytical Chemist, New York City.

Dr. CHAS. M. CRESSON, Assistant Engineer, Gas Work, Philadelphia.

Professor A. K. EATON, Analytical and Consulting Chemist, New York City.

Professor HENRY L. EUSTIS, Professor of Chemistry and Physics at Lawrence School, Harvard University, Cambridge, Mass.

Professor F. A. GENTH, Analytical Chemist, Philadelphia.

Professor WOLCOTT GIBBS, Professor of Chemistry and Physics, in the Free Academy, New York City.

B. FRANKLIN GREENE, Director of the Glenmore, N. Y., School of Engineers.

Professor A. A. HAYES. M.D., Consulting Chemist and Assayer, to State of Massachusetts, Boston.

Professor JOSEPH HENRY, Secretary of the Smithsonian Institution, Washington, D. C., discoverer of the principle of Electro-Magnetism, as applied to the telegraph.

Professor CHARLES T. JACKSON, Assayer to the State of Massachusetts, Boston.

Professor JAMES J. MAPES, late Professor of Chemistry and Natural Philosophy in the National Academy of Design, and Professor of Chemstry as applied to the Useful Arts, in the American Institute, N. Y.

Commander M. F. MAURY, U. S. Navy, Superintendent at United States Observatory, Washington, D C

Professor JAMES RENWICK, Emeritus Professor Natural Philosophy and Chemistry, Columbia College.

CARL SCHULTZ, Assayer's Assistant United States Assay Office, New York City.

Professor BENJAMIN SILLIMAN, JR., Professor of general and applied Chemistry, Yale College, Ct.

Professor JOHN TORREY, United States Assayer and late Professor of Chemistry in the College of Physicians and Surgeons, New York.

THE ENGINEERS and CHEMISTS of the various Gas-Light and Water Companies, and officers of SANITARY ASSOCIATIONS throughout the United States.

TRANSLATOR,

Captain THEOPHILUS D'OREMIEULX, late of the U. S. Army, late professor of French at U. S. Military Academy, West Point.

ALBION, N. Y.—The suit against this Co., has just been tried in the Supreme Court before Judge Davis, and resulted in a verdict against the Company for *fifty-four dollars*.

The Plaintiff claimed to recover on three items, first, for damage while the erection of the works was progressing, obstructing his right of way depositing earth and stone against his fence &c.; second, depositing gas-tar and ammoniac matter, in a large public sewer, into which his cellar drain emptied, thus causing his cellar to be filled with bad odors, spoiling his butter, cabbages, pumpkins, &c., injuring his health and making his dwelling uncomfortable; third, for damages to his property on account of contiguity of the works, and the smoke, dust and gas, arising therefrom, and claimed to recover for permanent damages to his dwelling.

The contractors who erected these works engaged with the Company to procure a lot, build the works, lay a certain amount of mains, and furnish all necessary tools, &c., to manufacture a certain amount of gas daily, and invest the title to said lot in the Albion Gas-Light Company, when accepted by them.

The Judge stated on the trial that the Plaintiff could not prove a depreciation in the *value* of his property, he could prove only for loss of *use* of his property up to the commencement of this action. He also charged the jury that the Company were not liable for any damages done before they took possession of the works.

And also, that gas works properly constructed and operated, were not such a nuisance as the Court would order removal, that occasional escapes of gas though unpleasant to the noses, were not injurious to the lungs, and therefore not among that class of cases for which damages could be recovered.

The Plaintiff claimed to recover $1000 for his impaired health, and $2000 for his damage to property.

The Plaintiff had better have taken our advice and become a stockholder.

AMERICAN GAS COALS.—Messrs. J. HEARN & Co., of Erie, Pa., advertise their gas coals on the first page, and we would say that we have seen a letter addressed to them by one gas company, ordering 15,000 tons, after a careful analysis and experiment. Messrs. Hearn & Co. are now able to supply orders for any quantity at the Atlantic or Inland ports.

THE SEWERAGE OF TOWNS, AND THE IMPOVERISHMENT OF SOILS.

We were favored a short time ago with a communication from the Hon. ANDREW TEN BROOK, Consul of the United States at Munich, relative to the following letter addressed by Baron VON LIEBIG to Mr. MECHI, a celebrated English scientific agriculturist.

We have great pleasure in submitting this able paper to our readers. Our limits have compelled us to slightly abridge it, though the force and terseness of the style, and the compact array of valuable arguments which it so earnestly and lucidly sets forth, precludes much condensation on our part. M. LIEBIG is extremely anxious that his views should be widely promulgated, and freely canvassed in this country. He has also expressed his intention to resume the subject in reply, should any of his positions be doubted, or found to require confirmation. We cannot but express the conviction that much good is likely to result from the intelligent discussion of topics so intimately connected with many of the most important interests of this country.

After some general remarks relative to the inadequate results which had followed his efforts to spread correct knowledge on the subject in question, M. LIEBIG proceeds as follows:

"The ground of my small success lies clearly in the fact, that the majority of farmers do not know the extent to which their own interests are concerned in this matter, and because the views and conceptions of most men in regard to the circuit of life and the laws of the preservation of our race, do not generally rise above those of C. FOURIER, the inventor of the phalanstery. He proposed, as you know, to supply the wants of the occupants of his phalanstery by means of eggs. He supposed it was necessary only to procure a couple of hundred thousand hens, each of which would lay thirty-six eggs a year making as many millions of eggs, which, sold in England, would produce an immense income. FOURIER knew very well that hens lay eggs, but he seemed not to know that in order to lay an egg they must eat an amount of corn its equal in weight. And so most men do not know that the fields, in order permanently to yield their harvests, must either contain, or else receive from the hands of man, certain conditions which stand in the same relation to the products of the field as the hen's food does to the egg she lays. They think that diligent tillage and good weather are sufficient to produce a harvest; they therefore regard this question as one in which they are wholly unconcerned, and look forward carelessly and with indifference to the future.

"As physicians, who in the apparent signs of a young man's blooming health, discern the fatal worm which threatens to undermine his organic frame, so in this case should those discerning men who are capable of comprehending the range of the question, raise earlier the voice of warning.

"It is true that the diligent tillage of the fields, sunshine, and timely rain, are the outward conditions, perceptible to all men, of good harvests, but these are perfectly without effect upon the productiveness of the field, unless certain things not so easy of perception by the senses are present in the soil, and these are the elements which serve for nourishment—for the production of roots, leaves and seeds—and which are present in the soil always in very small quantity in proportion to the mass of the soil itself.

"These elements are taken from the soil in the products of the field, in the corn, or in the flesh of the animals nourished by these products, and daily experience shows, that even the most fruitful field ceases after a certain series of harvests to produce these crops.

"A child can comprehend that under these circumstances, a very productive field, in order to remain *very* productive, or even simply productive, must have the elements which had been withdrawn in the harvests perfectly restored; that the aggregate of the conditions must remain, in order to produce the aggregate results, and that a well, however deep it may be, which receives no supply of water, must in the end become empty, if its water is constantly pumped out. Our fields are like this well of water. For centuries those elements which are indispensable to the reproduction of the field crops, have been taken from the soil in those crops, and that, too, without being restored. It has only recently been ascertained how small a supply of these elements the soil really has. A beginning has been made to restore to the fields the loss which they sustain through the annual harvests, by introducing from external sources manures containing the same elements. Only a very few of the better informed farmers perceive the necessity of this restoration, and those of them who have the means have zealously endeavored to increase the amount of these elements in their fields; but by far the greater part of them know nothing of such restoration—they think that they may continue to take from the field as long as there is anything left, and that it will be time enough to provide for this necessity when it knocks at their doors. They do not of course know how large is their stock on hand, nor are they aware that when the necessity shows itself, there will be then no means to meet it. They know not that what they have wasted is irretrievable.

"The loss of these elements is brought about by the 'sewerage system of towns.' Of all the elements of the fields, which, in their products in the shape of corn and meat, are carried into the cities and there consumed, nothing, or as good as nothing, returns to the fields. It is clear that if these elements were collected without loss, and every year restored to the fields, they would then retain the power to furnish every year to the cities the same quantities of corn and meat; and it is equally clear that if the fields do not receive back these elements agriculture must gradually cease. In regard to the utility of the avails of the 'sewerage of towns' as manures, no agriculturist, and scarcely an intelligent man, has any doubt; but as to their necessity, opinions are very various.

"Many are of the opinion that corn, meat, and manures, are wares, which, like other wares, can be purchased in the market; that with the demand the price may perhaps rise; but this will also stimulate the production, and that all turns upon having the means to purchase, and so long as England has coal and iron she can exchange the products of her industry for the corn, meat and manure which she has not. In this respect I think it would be wise not to be too confident of the future, for the time may perhaps come, even in half a century, that not one of those countries upon whose excess England has hitherto drawn, will be able to supply her with corn, and that too, from the natural law, that what is true of the smallest piece of ground is true also of a great country—it ceases to produce corn if the conditions of the reproduction of the corn which has been carried off are not restored to it. Nor, furthermore, is it certain whether the corn-growing lands will always desire to exchange their corn for the products of English industry, since they may no longer need these products, or at least not in the ratio of England's need of corn. In the countries of Europe, and in the United States of North America, great efforts are made to become in this respect independent of England, as being in the end the only way of keeping up the corn prices in these countries, so as to repay the labor of the people.

"In the United States the population increases at still greater ratio than in other countries, while the corn production upon the land under cultivation has constantly fallen off.

"History teaches that not one of all those countries which have produced corn for other lands have remained corn markets, and England has contributed her full share towards rendering unproductive the best lands of the United States, which have supplied her with corn, precisely as old Rome robbed Sardinia, Sicily, and the rich lands of the African coast of their fertility.

"Finally, it is impossible in civilized countries to raise the corn production beyond a certain limit, and this limit has become so narrow that our fields are no longer capable of a higher yield without an increase of their effective elements by the introduction of manures from abroad. By means of the application of guano and bones, the farmer of most limited capacity learns the real meaning of such increase; he learns that the pure system of stall or home-made manures is a true and genuine robbing system. In consequence of his restoring in the guano and bones but a shall portion of the very same elements of seeds and of fodder which had been withdrawn from his fields by centuries of cultivation, their products are wonderfully increased. Experiments instituted with special reference to this end in six different parts of the Kingdom of Saxony, showed that each hundred weight of guano put upon a field produced 150 lbs. of wheat, 400 lbs. of potatoes, and 280 lbs. of clover, more than was produced by the same-sized piece of ground without guano, and from this it may be calculated how enormously the corn and flesh production of Europe has been increased by the yearly importation of 100,000 tons, or 2,000,000 cwt. of guano.

"The effect of guano and bones should have taught the farmer the real and only cause of the exhaustion of his fields; it should have brought him to perceive in what a condition of fertility he might have preserved his fields, if the elements of the guano which he has transported in the shape of meat and products of his fields into the cities, were recovered and brought into a form which would admit of their being restored every year to his fields.

"To an understanding of this, however, the farmer has not yet come; for, as his forefathers believed that the soil of his farm was inexhaustible, so the farmer of the present day believes that the introduction of manures from abroad will have no end. It is much simpler, he thinks, to buy guano and bones, than to collect their elements from the sewers of cities, and if a lack of the former should ever arise, it will then be time enough to think of a resort to the latter. But of all the farmer's erroneous opinions, this is the most dangerous and fatal.

"If it is perceived that no country can perpetually supply another with corn, then must it be perceived that the importation of manures from another country must cease still earlier, since their exportation diminishes the production of corn and meat in that country in so rapid proportions that this decrease in a very short time manifestly forbids the exportation of manures. If it is considered that a pound of bones contains in its phosphoric acid the necessary condition for the production of 60 lbs. of wheat; that if the English fields have become capable, by the importation of 1,000 tons of bones, of producing 200,000 bushels more of wheat in a series of years than they would have produced without this supply, then we can judge of the immense loss of fertility which the German fields have sustained by the exportation of the many hundred thousand tons of bones which have gone from Germany to England. It will be conceived that if this exportation had continued, Germany would have been brought to that point, that she could no longer have been able to supply the demand of her own population for corn. In many parts of Germany, from which formerly large quantities of bones were exported, it has already come to be the case, that these bones must, at a much higher price, be bought back again in the form of guano, in order to attain to the paying crops of former time.

"The exportation of bones for so many years from Germany was possible only because the German farmers had less knowledge of the real nature of their business than the English, believing as they did that practice and science taught doctrines contradictory to each other, and were fundamentally different things, and that they must trust not in the laws of nature, but in recipes. Things have now changed for the better, although not to the extent to be desired, for the German farmers do not as yet generally understand the value of the element of bones for preserving the fertility of their fields, not to speak of the restoration of their *former* fertility; for if they all understood this, still no one could have any more bones; at all events no more than those which he brings to market in his grain and cattle.

"The prices of bones have become so high in Germany as to forbid their exportation, and if the question should be put to English commerce, whence it furnishes the English farmer with this to him indispensable manure, the answer would produce astonishment, for this commerce has so far robbed all the inhabited parts of the earth, that the manufacturer of super-phosphate can only set his hopes upon the phosphate lime of the mineral kingdom.

"In relation to guano, I have been assured that in 20 or 25 years, if its use should increase in even the same proportion as hitherto, there will not remain in South America enough to freight a ship. We will, however, suppose its supply and that of bones to continue for fifty years, or even longer—then what will be the condition of England when the supply of guano and bones is exhausted?

"This is one of the easiest of all questions to answer. If the common 'sewerage system' is retained, then the imported manures, guano, and bones, make their way into the sewers of the cities, which, like a bottomless pit, have for centuries swallowed up the guano elements of the English fields, and after a series of years the land will find itself precisely in the condition it was in before the importation of guano and bones commenced; and after England shall have robbed the cultivated lands of Europe even to complete exhaustion, and taken from them the power to furnish her longer with corn and manure, then she will not be richer than before in the means of producing corn and wheat, but will, from that time forth, become even poorer in these means.

"By the importation of guano and bones the population has, however, in consequence of the increased production of corn and meat, increased in a greater ratio than would have have been possible without this importation of manures, and this population will make upon the rulers of the State their natural demand for food.

"If men do not deem it desirable that the balance between population and the supply of food be restored by means of exterminating wars and revolutions, (in which the want of food has always played a certain part), or by means of wasting plagues, pestilence, and famine, or by emigration *en masse*, then should they reflect that the time has arrived for getting a clear view in regard to the causes of the existence of the increase of population. A very little reflection will lead to the conviction that the relations of populations are governed by a great and comprehensive natural law, according to which the return, duration, increase or diminution of a natural phenomenon depends upon the return, duration, increase, or diminution of its conditions. This law governs the return of the harvest from our fields, the maintenance and increase of the population, and it is easy to see that a violation of this natural law must exert upon all these relations a pernicious influence, which can be set aside in no other way than by the removal of its causes. If, then, it is known that certain existing relations work deleteriously upon the fields, if it can be foreseen that their continuance must bring about the ruin of agriculture, if there is but a single one of all the means which have hitherto resisted this deleterious influence and made it less sensibly felt, which can be safely relied upon to secure a perpetual fertility to our fields, and it is certain that this means, by a simple change and improvement of the existing deleterious state of things, can be obtained, then it becomes us to think whether a nation should not summon up all her intellectual and material resources in order to preserve these fundamental conditions of her welfare.

"It has been maintained that the recovering of the manure-elements out of the sewers in the large cities is impracticable. I am not ignorant of the difficulties which stand in its way—they are indeed very great; but if the engineers would come to an understanding with the men of science in relation to the two purposes—the removal of the contents of the sewers and the recovery of their valuable elements for agriculture—I do not doubt that a good result would follow. Intelligence, in union with Capital, represents a power in England which has rendered possible and practicable things of much greater apparent difficulty. I look forward with deep concern to the solution of the "sewerage question." For if this question is decided in Great Britain without regard to the wants of agriculture, we can scarcely hope for anything better upon the continent.

"Permit me to add still a few words in relation to the leading article of the *Times* of the same date, in which the one side of this question is taken up with great clear-

ness, while the author of the article seems to have views not quite correct in regard to its bearings as it presents itself to my mind. The mistake into which he has fallen arises from his confounding the condition of a State with that of its population.

In the natural sciences we know nothing of a State, of its might or its feebleness. We know only of lands, their geological formation, their climate and soil, and whether the soil contains the natural conditions for the subistence of man and beast. In places where these conditions are abundantly present, and geological circumstances do not hinder their intercourse, men cannot be exterminated. The most wasting war cannot rob a land of the conditions which nature has given, nor can peace give them to a land which wants them.

M. Liebig proceeds to cite examples from ancient and modern history, and from the force of human intelligence exhibited in sustaining human society and overcoming resisting influences, he terminates his long chain of cogent and powerful argument by deducing the conclusion that if the British people do not take the pains to supply to the soil the elements annually consumed by its vegetable products—if they allow its elements of fertility to be exhausted and the natural means of replenishing these to be squandered, their fields will, at no distant day, cease to be fruitful, and will inevitably refuse to produce their wonted returns of corn and other food for man.

RESIGNATION OF THE PRESIDENT OF THE CROTON AQUEDUCT BOARD.

His term of office being about to expire, Myndert Van Schaick, the worthy President of the Croton Board, sent the following communication to the Mayor:

CROTON AQUEDUCT DEPARPMENT,
NEW YORK, Jan. 2, 1860.

Hon. Fernando Wood, Mayor:

Dear Sir—My period of service in this department being on the point of its termination, I shall retire from the performance of the duties of my station as soon as a successor is appointed. Having received the appointment from your selection and preference, I am gratified by the circumstance that our respective situations enable me to return it into your hands. My service in devising the plans, and preparing the laws for constructing the aqueduct and its appendages, and for the purpose of bringing the Croton water into the city, commenced during the prevalence of the Asiatic cholera in 1832, when I was Treasurer of the Board of Health, and furnished with the documents on the subject of water by a young gentleman in the office of the Clerk of the Common Council. Being a member of the Board of Aldermen, and of the Senate of the State at the same time, I did not place my own name, nor that of any one of my associates in the Board, on the list of five commissioners for the construction of the works which I presented to the Governor. It was a great sacrifice of feeling, for me or for them to make to a sense of public duty and propriety. In 1842 I became a member of the first Water Board created by an ordinance of the Common Council, and served with singular attention, as I received no pay for nearly six years, when I was appointed President, and at the conclusion of my then service, presented to the Common Council an elaborate report and legislative form of an act creating this department on its present footing, adding the sewerage of the city to its duties, and recommending the purchase of one hundred and twenty acres of land for a new and great reservoir. The provisions in that law, which forbid the water being shut off for non-payment of the regular rents, and secured their payment by making them a lien on the property, conferred a great blessing on tenants and poor families, next to that system of operations which procured a pure and wholesome water for the people. Having then resigned, I was appointed by your Honor, in January, 1855, and have again served for five years. The whole period of my occasional engagements and active services in relation to the introduction of the water, and its distribution and management, is about sixteen years. I venture to say with confidence, that fidelity to a public trust, involving heavy responsibilities, and entirely new to me when I commenced, was never more successful in the results of its plans and efforts, and that I have not committed an important mistake during my whole career. I therefore retire from public life with perfect satisfaction, and no regrets on any account; and I remain, with the highest approbation of your capacities and good intentions,

Your obedient servant,

M. VAN SCHAICK.

SYSTEMATIC BALLOONING.

The art of ballooning being so dependent upon the subject to which the AMERICAN GAS-LIGHT JOURNAL is mainly devoted, a word in reference to the progress of both may legitimately find a place in its pages. While the common carburetted-hydrogen made from bituminous coal, has not so great a lifting power as pure hydrogen, (that is, while coal gas will lift about 40 pounds to the thousand feet—a little more or a little less—hydrogen will lift about 60 pounds, more or less, according to its purity), the coal gas is nevertheless preferable to the use of experimental ballooning, for reasons of accessibility and impermeability. Gas Companies should not overlook this matter, and they should all have facilities for the inflation of balloons. In looking over your large list of Gas Companies now in operation in the United States, it more than indicates to my mind the advance ballooning will make in the coming ten years. These machines can now be made air-tight, non-combustible, and so manageable, that, with the facilities of gas works in every town of over 1,000 people, and the cheapness of the gas for inflation, with the moderate price at which balloons can be furnished, it is safe to predict that there will be from one to a dozen of æronauts in every town having works of capacity sufficient to supply at least 8,000 cubic feet at a time.

No village company should have a gas-holder of less than 20,000 feet capacity, even if the consumption does not exceed 2,000 feet a day at the start. The time is not far off when we shall use much gas in culinary purposes, and the lighter branches of art manufactures. Twenty years ago I wrote and strove to have gas introduced into the city of Lancaster, Pa., and in nine years of trial succeeded in getting a tardy move towards its introduction. When I sold the stock for the establishment of the company, and portrayed the advantages of gas-light, and the cheapness of coal gas at three and four dollars per thousand cubic feet, compared with oil and tallow light, I was honest to tell subscribers that their gas bills would overrun their old fogy oil and camphene bills, because it was so natural to have "light, more light," that they would use twice, thrice, and six times as much light under the gas-light system as they did under the old-fashioned system of eight candles to the pound. They have all realized this, and nevertheless, they would now think it as uncomfortable and retrogressive to abandon the gas at three dollars per thousand, as to abandon their buckwheat cakes and coffee for breakfast, at three and fifteen cents per pound.

In its train of light and progress, I bespeak for systematic ballooning an equal degree of development. Air-sailing is as simple as gas-lighting. The management of a properly constructed balloon apparatus is as simple as the management of a skiff. I know that the multitude yet look upon it with a fearful eye. So did they in the first adventures of the *Argonauts*. With the former, as with the latter, we want only to become accustomed to it, and then we will look at the *bubble* in the air with as much composure as to its durability and safety, as we do now at the *shell* tossed upon the billows of the sea.

I have established a balloon factory, from which I can furnish balloons at a very moderate cost, of serviceable qualities, and with them furnish directions for their management, so that an ordinarily handy man can use them as successfully as he can a boat or buggy. With the facilities of gas-works to inflate a one-man balloon, it is no more trouble to make an ærial voyage of a few miles, or a few hundred miles, than it is to harness up a horse and travel with him that distance.

Lancaster, Pa., Jan. 9th, 1860. JOHN WISE.

EVAPORATION OF WATER IN GAS METERS.

SIR—Having had my attention directed to the loss of water by evaporation from wet gas-meters, I some time ago determined to ascertain the actual loss, in a given time, by an experiment on a tolerably large scale.

With that view, I took particular care, during our survey in the month of May last, to adjust correctly with water, all the meters which were at that time in action. They received no more attention during the ensuing six months; and when the 15th of November came round, I provided myself with a flask holding exactly one gallon, a filter, and a small tray for receiving the surplus water. Equipped with these, I proceeded on my survey, noting each day the quantity of water used, as well as the number of meters gone over; and at the end of the survey I ascertained that the number of wet meters amounted to 528, and that the quantity of water required was 24 gallons. The number and sizes of the meters were as follows:

474	No. 1 meters,
36	" 2 "
14	" 3 "
4	" 4 "
Total,	528

Their united area (measured at the water-line) amounts to 41,421 square inches, giving an average area to each meter of 78·5 inches nearly.

We also found that one gallon of water sufficed for 22 meters; and 277·274 cubic inches, or one gallon, divided by 22 gives 12·6 cubic inches as the actual quantity of water lost by each meter during the six summer months above noted.

The quantity of gas registered on these meters, during the time of the above experiment, amounted to 1,100,000 cubic feet; and it is very remarkable that during the whole summer my attention was not called to them in any way, although they are (almost without exception) fitted with valve and float.

I may also state that the initial pressure at our works is 2 inches in winter, but from the works standing on an elevation rather higher than the town itself, and the town being of the form of the letter A, with the works situated at the apex, the pressure averages only 1¼ inches to our consumers.

If you think the above facts would be useful at the present time, when the attention of the public is so much directed to that subject, in connexion with Lord Redesdale's Sale of Gas Act, I shall be well pleased to see you find a place for them in your valuable JOURNAL.

Dec. 20, 1859. J. R. H.

ARGUMENTUM KNOCK-DOWN-IBUS.—A friend in London sent us, the other day, the file of one of the so-called English Journals, comprising eight volumes, the whole of its eleven years' existence. When the freight bill came in we remonstrated at the exorbitant charge, but were assured it was the regular price for heavy goods. Of course there was nothing more to be said, and we paid up without flinching.

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THOMAS GLOVER thinks it necessary to put Gas Companies on their guard against parties selling Patent Dry Gas-Meters constructed in imitation of his, but unskilfully made on erroneous principles, and with improper and unsuitable materials.

THOMAS GLOVER's Workshops are now the most extensive in this or any other country, and he is thereby enabled promptly to execute orders to any extent required. Purchasers may, at any time, inspect his Works and the materials of which his Meters are constructed.

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THESE OBTAINED A GOLD PRIZE MEDAL IN EUROPE, WHERE THEY are now extensively used in place of metal tips. In Prof. LIEBIG's celebrated work on Chemistry, and by the most celebrated Chemists in Europe and the United States, these mineral burners are highly recommended as being *indestructible by acids or alkalies, unchangeable by heat or cold, not liable to rust or corrosion*, and far superior in economy to the metal tips. No kind of the numerous Burners now in use can give general satisfaction that have metallic tips, which become either rusty, corroded, or enlarged, causing an unperceived waste of gas to consumers, who find fault with their exorbitant gas bills Boston and many other cities have adopted them for street lights after a full and satisfactory trial. They are imported from Germany by the undersigned, sole Agent for America, who can now supply the trade or cities at reduced prices, with any pattern of tips to fit the double cylinder or other kind of burners. For sale also, Large Gas Heating Burners, of same material, for Chemists, &c.

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Samples and prices forwarded on application to the above address. For sale, also, by some of the rincipal Gas-Fixture dealers in the United States. February 1st, 1860.

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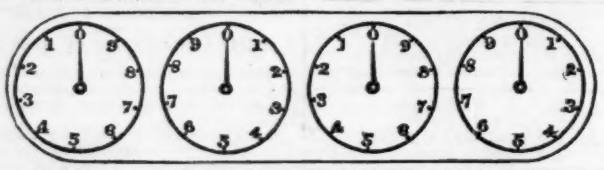

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The best, therefore the cheapest for Gas and Water Meters and Engineers' Indicators.

These Dials are particularly adapted to all purposes where gas, gas-vapors, or acids, are present. Also, Watch and Clock Dials of every description, from any size up to 14 inches diameter.

The undersigned embrace this opportunity of returning their thanks to the gas-meter manufacturers throughout the United States, for the very liberal patronage they have received for the past ten years, during which they have been established in Philadelphia, which has placed us ahead of all competition.

Our sales for the past year have been far greater than we could possibly have anticipated, with the prospects of a steady increase. Our constant aim has been, and will be, to adopt all improved processes of manufacture, combining improvement in quality with reduction in price All Dials made by us are warranted to be as represented, and of the best materials and workmanship, which will recommend them to all parties wishing the very best. Circulars sent free by mail, or on application.

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Cities and Gas Companies furnished at reasonable rates with

LANTERNS, IRON FRAMES,

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Fancy Lanterns,

For Hotels, Restaurants, Theatres, Telegraph Offices, Churches, and other Public Buildings.

Having been in the business for many years I fully understand the manufacture of Gas Lanterns, and with the aid of machinery can make the parts cheaper than any other manufacturer. Orders from a distance solicited, and executed promply.

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PATENT FIRE-CLAY

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Of all Forms and Sizes. and of a

REDUCED THICKNESS!

FIRE BRICKS,

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EXPERIENCE HAS PROVED THAT A THIN RETORT INSURES A MORE rapid distillation and a saving of fuel; it only remained, to overcome the inconveniences resulting from the porosity of the Fire-Clay, which we have done by our patented method of moulding. The homogeniousness which we can give to the raw material makes it possible to obtain, even in the first charges, all the gas the coal will yield; it is not necessary to wait till a coating of carbon is formed to insure this result, and the Retorts can be allowed to cool down with safety when a diminution in the consumption renders it necessary.

We have in our establishment the different parts for Furnaces, fitted in such a way as to obviate the numerous joints produced where brick is employed; each block is numbered, and they can be put together by an ordinary workman. It is only necessary, therefore to send us a drawing with the dimensions of Furnaces, and apparatus which are desired.

By mixing the raw materials with cements which have been subjected to the highest temperatures, expansion and contraction are prevented.

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Duncan Sherman & Co., Richard Irvin & Co., John B. Murray, and Union Bank, New York; Webster Bank and Peter Wainwright, Esq., Boston; E. F. Satterthwaite, London; Alfred F. James, Galveston, Tex.; Ogden, Fleetwood & Co., Chicago; Erastus Corning, Esq., Albany; W. Fisher & Son, Baltimore; J. P. Kilbreth, Cincinnati; G. Parish Ogden, Troy.

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FLEXIBLE GAS FITTINGS.

The existing great demand for Hancock's ENAMELLED or GLAZED FLEXIBLE TUBING, and the increased facilities of manufacturing it is an assurance of the satisfaction experienced by the public in the use of this article, so extensively made by JAMES LYNE HANCOCK, OF LONDON, who begs now to announce to the trade, that he continues to export, to a large extent, FLEXIBLE GLAZED TUBING for GAS, Surgical and other instruments, now in such general use amongst Gas Companies, Engineers, Gas-fitters and others.

This is the only TUBING that perfectly resists the action of coal gas. It is made of all sizes, from ⅛ inch up to 1¼ inches, and in 60 feet lengths. The measure is always external diameter, to connect the usual metal fittings.

SOLID VULCANIZED INDIA RUBBER TUBING, for GAS, WATER, &c., made of all sizes, and in 60 feet lengths, either with or without spiral wire inside.

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N. B.—Orders by post, with remittance, or good reference in England, will be promptly executed.

MOST IMPORTANT TO ALL Consumers of Gas.

HART'S PATENT GAS-BURNER.

HART'S PATENT ECONOMIZING GAS BURNERS have been adopted by thousands of public and private establishments, Gas Companies, for Street Lamps, &c., &c., in various parts of Europe, after proving the utter WORTHLESSNESS of GAS REGULATORS and other inventions ALLEGING to produce a MAXIMUM amount of light with a MINIMUM amount of gas, and are considered by all who have given them a trial to be the most economical—effecting a positive saving of from 5 to 35 per cent.—and the only means capable of producing a WHITE, THIN AND PURE FLAME of such brillancy as was never before obtained from gas by whatever means consumed, as proved by photometrical tests made with the most improved instruments by Bunsen, Wheatstone, King, and Wright, *the superior light varying in degree from 5 to 100 per cent.* This invention, patented by Mr. HART (of Fleet street, London), in England, France, Belgium and other foreign parts, is now being universally adopted, and will doubtless continue to be so long as gas is used.

The principle of the invention consists in the gas being (in its passage through the burner) resisted primarily by a FIBROUS MATERIAL, thence passing through a diaphragm of felt encased in two perforated metallic discs, so that the pressure with which the gas is supplied from the mains becomes checked, and permits the gas to reach the orifice of the burner with only such velocity as may be requisite to develope a FULL AND BRILLIANT FLAME while perfect combustion is simultaneously secured, and thus is prevented the escape of unconsumed gases which so deteriorate the atmosphere as to produce a most injurious effect upon the health, and are alike destructive of works of art.

HERBERT WILLIAM HART,
69 Fleet street, London.
Or care of AMERICAN GAS-LIGHT JOURNAL, N. YORK.
(For engravings see AMERICAN GAS LIGHT JOURNAL for December, 1859, page 100.)

BY ROYAL LETTERS PATENT.

GEORGE ANDERSON, GAS ENGINEERING Offices, 104 Leadenhall st., London, E. C., Patentee of the Direct-acting Piston Exhauster, &c., begs to draw the attention of the Engineers and Managers of American Gas-works to his Patent Purifying Changing or By-pass and Shut-off Valves.

COWEN'S PATENT FIRE-CLAY Retorts.

JOSEPH COWEN & Co., Blaydon Burn, near Newcastle-on-Tyne, England, were the only parties to whom a Prize Medal was awarded at the Great Exhibition in London, of 1851, for "GAS RETORTS AND OTHER OBJECTS IN FIRE CLAY."

J. C. & Co. have been for many years the most extensive manufacturers of Fire Clay Retorts in the United Kingdom; and orders for FIRE CLAY RETORTS of all shapes and dimensions, FIRE BRICKS, and every other article in Fire Clay, are promptly executed at their works as above.

COWEN'S GARESFIELD COAL AND COKE.
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QUAY SIDE, NEWCASTLE ON TYNE.

NATIONAL GAS APPARATUS.
GEORGE BOWER, Gas Engineer, and Contractor, ST. NEOTS, Huntingdonshire, England, Contractor for the erection of GAS-WORKS of any magnitude and manufacturer of GAS-FITTINGS, METERS, REGULATORS, and all apparatus connected with the production and distribution of gas. Patentee of the following:

1st. Portable Cannel Coal Gas Apparatus, requiring neither skilled labor nor brickwork to fix, but complete in itself for 10, 20 and 30 lights; specially adapted for cannel coals which do not coke.

2d. Retorts fed and discharged by machinery, so that gas-making by this apparatus is conducted without any nuisance whatever; adapted for 40 and 70 lights, and for cannel coal of Lancashire quality.

3d. Combined apparatus, forming in one vessel the HYDRAULIC MAIN, CONDENSER AND PURIFIER; adapted for all sized works, from 100 up to 500 lights, and any quality of coal may be used with these works.

The advertiser has patterns complete for all sizes up to 2,000 lights, and can forward orders expeditiously. He requires first-class houses to represent him in America, Canada, and the Brazils. All applications to be prepaid.

WILLIAM RYDER.
General Mineral and Metal Agent and Merchant, 4 Dean street, NEWCASTLE-ON-TYNE, England, is prepared to supply Gas Companies and others with every variety of appliance for the production and supply of Gas, including GASOMETERS, RETORTS (metal and clay), FIRE BRICKS, COALS, METAL MAINS, TUBES, in wrought iron, copper, brass, lead or composition, METERS, TAPS, FITTINGS, &c., &c.; and from his extensive experience in this class of work, can guarantee every thing of the best description.

TO GAS COMPANIES,
The advertiser (28 years of age, presently residing in Scotland), having had thirteen years' practical experience in everything incidental to the formation and management of gas works, desires an appointment with some gas company in America. Is fully competent to undertake the duties of Superintendent or Engineer of an extensive gas-works. Salary required, moderate. Further particulars and testimonials can be seen, by applying at the Rooms of the AMERICAN GAS-LIGHT JOURNAL. J. H. F. S.

GEORGE W. KRAFT, GASOMETER and Boiler-maker, Chestnut st. wharf, West Philadelphia, manufactures Gasometers, Retort House Roofs, Water Tanks Purifying Boxes, Coal Cars, Coke Barrows, and all kinds of Wrought Iron Work for Bridges, Buildings, &c.

Particular attention paid to Alterations and Repairs.

REFERENCES:
John C. Cresson, Engineer Gas Works, Philadelphia; Joseph A. Sabbaton, Engineer Manhattan Gas Works, New York; Col. W. S. Campbell, Engineer Gas Works New Orleans; P. A. Sabbaton, Engineer Gas Works, Albany; Waterhouse and Bowes, Gas Engineers, Raleigh, N. C.; Joseph Battin, Newark, N. J.; C. B. Dungan, Philadelphia.

DANIEL THOMPSON,
Machinist and manufacturer of Stop Cocks, Fire Plugs, &c., for Water-Works, STOP COCKS, VALVES, DRIP PUMPS, &c., for Gas-Works, No. 133, Elfreth Alley, Philadelphia.

I AM PREPARED to furnish, at my Balloon Factory at this place, Balloons complete and ready for service, manageable by ordinarily skillful persons, at reasonable prices. For a Balloon of fine linen, large enough to carry two men, ready to ascend, the price will be $250. Other sizes in proportion. My Balloon Linen is made to my own order in Europe.

List of prices of Balloons, all complete for use.

Feet. Diameter.	Lifting power with coal gas.	Prices.
25	220	$200 00
26	225	210 00
27	290	220 00
28	325	235 00
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32	500	300 00
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At these prices can furnish good serviceable Balloons, which are easily managed, will make hundreds of ascensions, and which an ordinary person may use with as much success as he can a horse and buggy.

JOHN WISE, Lancaster, Pa.

HOPE IRON FOUNDRY,
PROVIDENCE, R. I.
Gas-Work Castings of every description.
They would call attention to their superior IRON RETORTS, which are extenivsely used with good satisfaction; also to E. WALCOTT'S PATENT MOUTH and LID, possessing important advantages over any other in use, and are shown in a circular which can be obtained by addressing—
JOS. P. MANTON, Agt.

GASOMETER RIVETS.
Every kind of Rivets used in Gasometers. PHILLIPS & ALLEN,
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PATENT PYRO-CLAY GAS RETORTS. THOMAS HOADLEY, Patentee, wishes to call the attention of Gas-engineers to these Retorts, as a very superior article.
REFERENCES:—Gas-Light Works, Buffalo, N. Y.
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WEST TROY, (N. Y.,) IRON FOUNDRY.
AUGUSTUS VIELE, Manufacturer of Gas and Water Pipes of all sizes. DRIPS, SYPHONS, BENDS, AND BRANCHES. The manufactures of this establishment are in use in various Gas and Water Works throughout the country.
Address AUGUSTUS VIELE, West Troy, N. Y.

F. A. SABBATON, ALBANY, N. Y., Gas Engineer and Contractor.
COAL AND ROSIN WORKS of any capacity constructed on the most approved plans.
Refers to CHARLES ROOME, ESQ., Prest. Manhattan Gas-Light Co., N. Y.; R. PUMPELLY, ESQ., Prest. Albany, N. Y., Gas Light Co.,; J. K. BRICK, ESQ., Engineer Brooklyn, N. Y., Gas Co.

THE AUBIN GAS-WORKS CO.,
(No. 44 State street, Albany, N. Y.,) will refer parties wanting GAS-WORKS FOR VILLAGES to seventeen of their Village Works now in operation in the United States and the Canadas in *every one of which the profits of the company are ten per cent. and upwards, and yet good gas is furnished.* Agents wanted to extend the sale of the AUBIN PORTABLE GAS STOVE for dwellings, factories, &c., which will make 1000 feet of gas in five hours, and with greater simplicity, safety and economy, than any other known apparatus.

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Plans and specifications furnished and Works erected for cities, towns and villages ROSIN WORKS altered and repaired. Pipe, &c., furnished and laid for Water and Gas.
E. A. COEN, Rondout, Ulster Co., N. Y.

GAS-COAL.—PENN COAL CO.— The Penn Coal Company having completed arrangements for mining and shipping coal on an extensive scale, are now prepared to receive orders. The mines are favorably located on the line of the Pennsylvania Railroad, 26 miles east of Pittsburgh, Pa. The coal has been tested by many gas works, and the highest testimonials will be furnished. Communications addressed to Mr. A. L. Massey, Philadelphia, will have immediate attention

BERGEN IRON WORKS.
Established 1833.
R. A. BRICK, Manufacturer of CAST-IRON WATER and GAS PIPES. RETORTS, PIPES, &c., always on hand, Office 109, Leonard street, New York.

T. G. ARNOLD, Manufacturer of Gas Burners, Mercury Cups, Portable Sockets, Burner Pillars, &c., No. 447 Broome street (second door west of Broadway), New-York Imported Scotch Tips and Burner Plyers always on hand

DARDONVILLE, Importer of Paris Bronzes, Gas-Fixtures, Carcel Lamps, &c. French Rape Seed Oil for sale. No. 623 Broadway, New York.

IRON GAS AND WATER PIPE.
JOHN GILKISON & CO., No. 90 Beaver street, New York City. Agents for the largest Iron Founders in Scotland. They are prepared to make contracts for the supply of IRON PIPE from 2 to 48 inches in diameter, for delivery in the Spring. Every description of Castings made to order. Wire Rope, &c., &c.

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LE JOURNAL DE L'ECLAIRAGE AU GAZ, published in Paris on the 5th and 20th of each month.
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Pattern and Model Designer and Maker, having had twenty-five years' experience, will assist and perfect inventions and designs. PATTERNS and MODELS made of WOOD, IRON, or BRASS (secretly, if desired,) on short notice.
N. B.—Stove and machine patterns of every description, made with elegance and precision.
Metallic letters for patterns always on hand.
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S. THOMPSON'S Nephew, IMPORTER,
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NOTICE TO GAS COMPANIES.
A Wet Meter once filled with Gengembre's Patent Non-Freezing and Non-Evaporating Gas Meter Fluid, is rendered equivalent to a Dry Meter as long as it remains in use.

CERTIFICATE OF PROFESSOR TORREY.

"At the request of Mr. Bogart I have subjected Gengembre's Patent Non-Freezing and Non-Evaporating Gas Meter Fluid to severe tests, in order to determine whether it will corrode the materials used in the construction of that instrument. I find that when they are exposed to the action of the liquit for many weeks, there is not the least corrosion of any of the metals.

"The liquid is not liable to freeze with any natural cold of this climate, and is so fixed that it will not lose bulk by evaporation.

"JOHN TORREY,
"Consulting Chemist of the Manhattan Gas-Light Company."

The extreme low price at which this fluid can be furnished, together with its established advantage to Gas Companies and consumers of gas, and the low price asked for the right of use, will induce its general adoption. All communications addressed to A. L. BOGART, sole agent for the Patentee, for the New England States and the State of New York, will meet with prompt attention.
Office No. 592 Broadway,
New York.

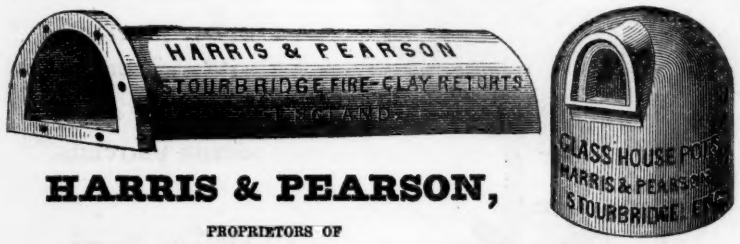
FREEZING OF GAS-PIPES.—Walton's Patent Anti-Freezing Apparatus illustrated by engravings, in the AMERICAN GAS-LIGHT JOURNAL, of January, 1860, page 141, is the most simple, durable and efficient of any known process.

According to Professor Faraday, the watery vapor contained in illuminating gas amounts to 0·0093 parts where the gas is at a temperature of 40°, or in other words, that there are 1, 7-10 *gills water in every* 1,000 *cubic feet of gas* at that temperature. It is the deposit of this water in the form of frost that closes the exposed pipes.

Walton's plan is, in a few words, to supply this water with a sufficient quantity of alcohol (98–100ths), the vapor of which will enable it to pass through the most exposed pipes, unaffected by frost. Experiments of three years prove that one gill of such alcohol will protect 1,000 feet of gas at any temperature. Private houses, Hotels and Gas-works, can be thus guarantied from frost by the use of Walton's Anti-Freezer, which consists of but two or three small castings, at the most trifling cost. It can be applied at Gas-works without altering any of the pipes; and the expense of labor and the alcohol will not exceed two cents per 1,000 feet of gas.

It can be seen in operation at the rooms of the AMERICAN GAS-LIGHT JOURNAL, Iron Buildings, No. 254 Canal street East, near Broadway, New York city, where orders will be executed at once.

Certificates from Gas-works where Walton's Patent has been in operation, will be exhibited.



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Best Glass-House, Pot, and Crucible Clay.
MAKERS OF THE IMPROVED BOHEMIAN GLASS-HOUSE FURNACE.
AMBLECOTE FIRE CLAY BRICK WORKS, STOURBRIDGE, ENGLAND.
Manufacturers of Fire Brick, Gas Retorts, &c.

JOHN ROGERSON & CO., NEWCASTLE ON-TYNE & Middlesbro'-on-Tees, London, supply Gas Coal, Clay Retorts, Cast Iron Pipes and Retorts, Gasometers, &c. A partner of the above house being now in this city, will be glad to wait upon any gas company requiring supplies. Agents, MEAD & BELL,
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TO GAS AND WATER COMPANIES:
The undersigned, Agent for Messrs. Thomas Edington & Sons, Phenix Foundry, Glasgow, Scotland, is prepared to contract for all descriptions of Cast-Iron Pipes of their manufacture.
About 6000 tons of these Pipes have lately been supplied to the Brooklyn Water-works, N. Y., and the Chief Engineer of the Works, A. P. Kirkwood, Esq., is ready to testify to their excellent quality.
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Sole Agent for the United States and Canada.

HIGHLY GLAZED FIRE CLAY Pipes, for Sewerage and Water Purposes, Gas Retorts, Fire Bricks, &c WILLIAM McKEAN, 74 Broadway, New York, agent for the "Field House Fire Clay Works," Huddersfield, England, is prepared to treat with corporations, Contractors, and Gas Companies, &c., for the supply of the above articles, either in Liverpool, or delivered at any important port on the Atlantic coast, from New Orleans to Montreal. The Field-house Pipes have been used for the sewerage of the pridcipal cities and towns in England, and are now being extensively used for the sewerage of the city of Brooklyn, N. Y. They are impervious to moisture or decay; will stand great internal and external pressure, and are cheaper than either brick or stone sewers

Further information can be obtained by application to

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MANUFACTURER OF

WET AND DRY PATENT GAS METERS,

Pressure-Registers, Pressure-Indicators and Gauges, Station, Show, Customer, and Experimental Gas-Meters, Centre or Hydraulic Valves, Governors, Compensators for Exhausters, and the Standard Testing Gas-Holders* for Proving Meters, now used in the State of New York in compliance with an Act of the Legislature. Also, Bunsen's Photometer, with complete Apparatus for working the same.

*The standard of measurement of this Gas-Holder is given by Professors TORREY, of the U. S. Assay Office; JOY, of Columbia College; GIBBS, of the Free Academy with several other distinguished scientific gentlemen.

ELLIMAN BROTHERS, 217 Pearl Street, NEW YORK,

Importers of Belgian Fire-Clay GAS-RETORTS,

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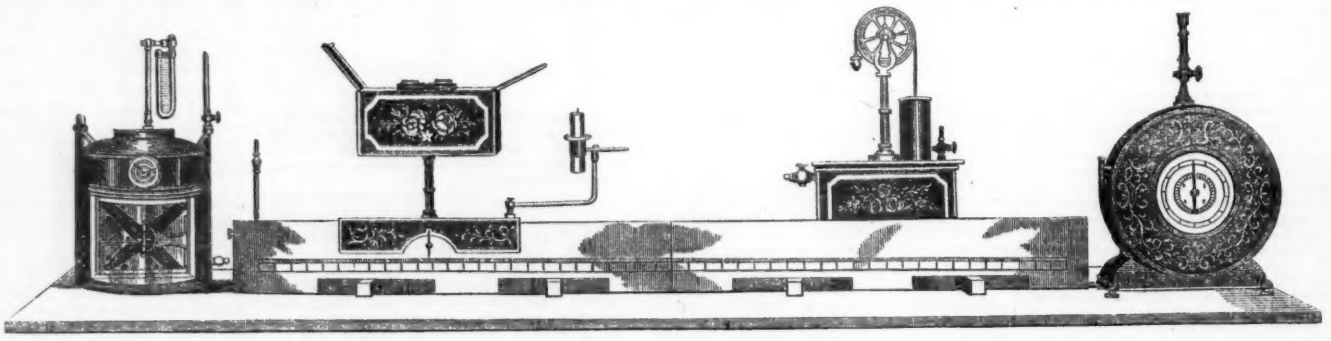
TILES, ARCH-BRICKS, FURNACE-DOORS, MOUTH-PIECES, COVERS, AND ALL OTHER FITTINGS, OF MOST APPROVED PATTERNS, FOR SETTING CLAY RETORTS, EXHAUSTERS, COMPENSATORS, VALVES, &C.

IMPORTERS AND DEALERS IN WROUGHT-IRON GAS, WATER, AND STEAM TUBES.



PRESSURE REGISTERS,

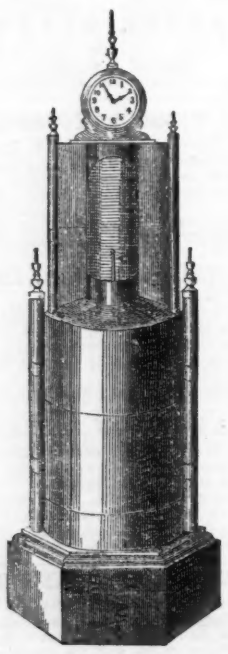
PRESSURE INDICATORS,

PRESSURE GAUGES,

PHOTOMETERS,

GOVERNORS,

STATION METERS,



CUSTOMER METERS,
(Wet and Dry.)

EXPERIMENTAL METERS,
(Wet and Dry.)

SHOW METERS,
(Wet and Dry.)

METER PROVERS,

CENTRE SEALS,
&c &c. &c.

THE high reputation which we have enjoyed for more than twenty-two years, and the fact that we have manufactured a greater number of Gas Meters than all manufacturers in this country combined, must present itself as a security to parties who are desirous of securing the most reliable instruments. Having completed an extensive addition to our factory, and added many important improvements to our machinery, we are enabled to fill orders entrusted to us with dispatch, and in all cases *guarantee entire satisfaction*. Our Patent Rotary Valve Dry Gas Meter is now used by upwards of two hundred gas companies, giving general satisfaction; we therefore recommend it, believing it superior to any other Dry Gas Meter manufactured. All meters tested separately by a sworn Meter Inspector, and sealed when desired.

CODE, HOPPER & GRATZ,

1500, 1502 & 1504 FILBERT STREET,

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GEORGE WRIGHT & CO.'S

LIVERPOOL AND NEWCASTLE CANNEL AND COAL

FOR GAS MANUFACTURE AND HOUSE USE.

THE undersigned does not submit for comparison the result of chemical analysis, as this plan is too often adopted to promote the sale of inferior or worthless coals that in practice bear no particle of resemblance to their theoretical, and sometimes distorted descriptions.

He is authorized, however, to guarantee the *careful shipment of the best qualities of Cannel and Coal, at the lowest rates of Invoice and Freight offered at time of engagement;* and any losses sustained by short weight, or the neglect of the conditions mentioned, will be promptly and cheerfully repaired.

OFFICE OF THE MANHATTAN GAS-LIGHT COMPANY,
New-York, October 8th, 1859.

Messrs. GEORGE WRIGHT & Co., Liverpool:

Gentlemen,—For many years you have acted as agents for this company, purchasing for, and forwarding to them, coals, retorts, and other gas apparatus.

Your experience, ability and sterling integrity, entitle you to and have secured our confidence, and we cheerfully recommend your house to all gas companies desiring the services of an agent in England. My own personal knowledge of the superior quality of the coals within your control, and my acquaintance with the manufacturers of such articles as can be advantageously procured by you in England for gas companies abroad, added to my high regard for you personally, induce me to write this letter, and express the hope that you may be able to extend your business in this country, not only for your own advantage, but also for the benefit of those who may confide in you as securely as we have done.

I am, gentlemen, your very obedient servant,

CHARLES ROOME, *President.*

T. W. PARMELE, Agent,
No. 4 Irving Place, New-York,
GAS-EXHAUSTERS,
GOVERNORS, FURNACE DOORS,
RETORT-COVERS, CASTINGS,
IMPLEMENTS,
PHOTOMETRICAL AND METER-PROVING APPARATUS.

E. V. HAUGHWOUT & CO.,
488, 490, & 492 BROADWAY,
Corner of Broome Street,
NEW YORK.
CONTRACTORS AND BUILDERS
OF
GAS WORKS.
N. TREADWELL, SUPERINTENDENT.

They respectfully refer to the following gas works, which have been erected by them, and are now in successful operation:

Fifth Avenue Hotel,	N. Y.	Gayoso House,	Memphis, Tenn.
Store 488, 490 & 492 B'dway	N.Y.	Dement House,	Fulton, Ill.
Haverstraw,	N. Y.	Nyack,	N. Y.

And the following by Mr. Treadwell:

Springfield Gas-works,		Mass.	Thompsonville Gas-works,		Ct.
Milford	do.	"	New Britain	do.	"
Clinton,	do.	"	Norwalk	do.	"
Ware,	do.	"	Norwich	do.	"
Glasgow Mills,	do.	"	Canelton	do.	Ind.

Read the followng certificate:—

The New Britain Gas-works, constructed under the personal superintendence of Mr. N. Treadwell, of Springfield, Mass., have been recently put in operation, and found all that could be desired. The Company are entirely satisfied with these works and would most cordially recommend Mr. Treadwell as a competent and successful gas engineer.

S. L. STRICKLAND,
President New Britain, Ct. Gas Co.

Messrs. E. V. Haughwout & Co. have on hand a most extensive assortment of the newest and most desirable styles of

CHANDELIERS, BRACKETS, LAMP POSTS, AND GAS FIXTURES OF EVERY DESCRIPTION,

To which they would respectfully call the attention of the public.

Gas-fitting done in the most workmanlike manner, and on reasonable terms.

JOHN COX & CO.
No. 696 BROADWAY, CORNER FOURTH STREET, NEWYORK.

IMPORTERS OF FRENCH AND ENGLISH GAS Fixtures of every description, Paris Clocks, Real Bronzes, &c. Manufacturers of Silver Ware.

PARAGON SELF-GENERATING
GAS-LIGHT BURNER.

Complete in itself, without other machinery. Applied with founts to gas fixtures in every variety; also, to hand lamps, such as use oil, burning fluid, coal oils, &c., making its own gas in the burner, *with entire safety from burning fluid.* Devoid of smell, smoke, or flicker; combining simplicity, economy, and brilliancy of light in any temperature; adapted to and used by churches, factories, dwellings, hotels, steamers, railroad cars, omnibuses, private carriages, street-lamps, &c., &c.—all at an expense of less than one cent per hour each burner. Call and see this light for the million, or send for circular.

BUTLER, HOSFORD & CO.,
171 Broadway, N. Y.

State and county rights for sale. Parties wanting gas in large and small quantities should apply as above before making other arrangements.

BUTLER'S PATENT PORTABLE GAS-WORKS are designed for Dwellings, Churches, Factories and Country Villages, as well as for large consumers in cities. They make gas from CRUDE ROSIN, and are WARRANTED to make as rich an article, at less than ONE HALF the cost of that made by the old method in Portable Gas-Works, and at one-third the average price of Coal Gas as sold in cities. Great savings in expense of light GUARANTEED to large consumers.

Works of all sizes furnished to suit applicants. Mains, Service and Distributing Pipes put in. Also, a large assortment of Gas-Chandeliers, and other fixtures, always on hand, at the lowest prices.

The MANSION HOUSE, BROOKLYN, with 250 burners in constant use, make their own gas with my apparatus, with results as stated above. This, (with a small one at my store,) can be seen in operation by application at my office, where descriptive pamphlets, with the names of numbers who are using them, will be furnished.

JOHN BUTLER,
Nos. 112 Fulton and 15 Henry street, Brooklyn, N. Y

WILLIAM ROY,
93 Beaver Street.

NEW YORK, IMPORTER OF THE CELEBRATED PERCETON FIRE-CLAY RETORTS the quality of which is superior to any other clay yet discovered. Analysis as under:

Silica	62.5	Magnesia	0.3
Alumina	35.0	Prox. of Manganese	0.2
Prox. of Iron	0.9	Phos. of Iron	0.5
Lime	0.6		

VITRIFIED FIRE-CLAY PIPES, from 2-inch to 36-inch, diameter, in lengths of two or three feet; are indestructible, and not affected by gases or acids.

Thomas Edington & Son's PATENT CAST-IRON PIPES are cast vertically to any weight required. They can also be coated with Dr. Smith's Solution, which prevents corrosion; adapted for gas and water. Made in lengths of nine and twelve feet, or turned and bored joints.

WROUGHT IRON TUBES and all materials for gas and water works Fire-Bricks, Fire-Clay, Water Hydrants, Scotch and English Cannel Coal, &c Kennedy's Water Meters for measuring the flow of water—indispensable to all water companies.

FELLOWS, HOFFMAN & CO.,
(Late STARR, FELLOWS & CO.,)

MANUFACTURERS OF GAS-FIXTURES AND Chandeliers, Solar, Camphene and Fluid Lamps Girandoles, Hall Lanterns, &c, No 74 Peekman st., New York.

W. ANDERSON,

MANUFACTURER OF GAS-BURNERS, NEW HAven Railroad Depot, cor. of Franklin and Elm sts., New York. Scotch Tips constantly on hand. Tips and Burners made to order. Brass Tips for street lights and other purposes made to order.

FRINK'S GAS-LIGHT REFLECTORS

FOR SHOW WINDOWS, BILLIARD TABLES, Desks, Churches, Halls, &c.

Frink's improved Day-Light Reflectors for obviating the use of Gas entirely in the day-time. Frink's Gas-Light Reflecting Shades for Banks, Offices, Parlors, &c. Frink's Concave Gas-Light Reflectors. No. 68 Barclay street, near Greenwich street, New York.

Coal-Scoop for filling Retorts.

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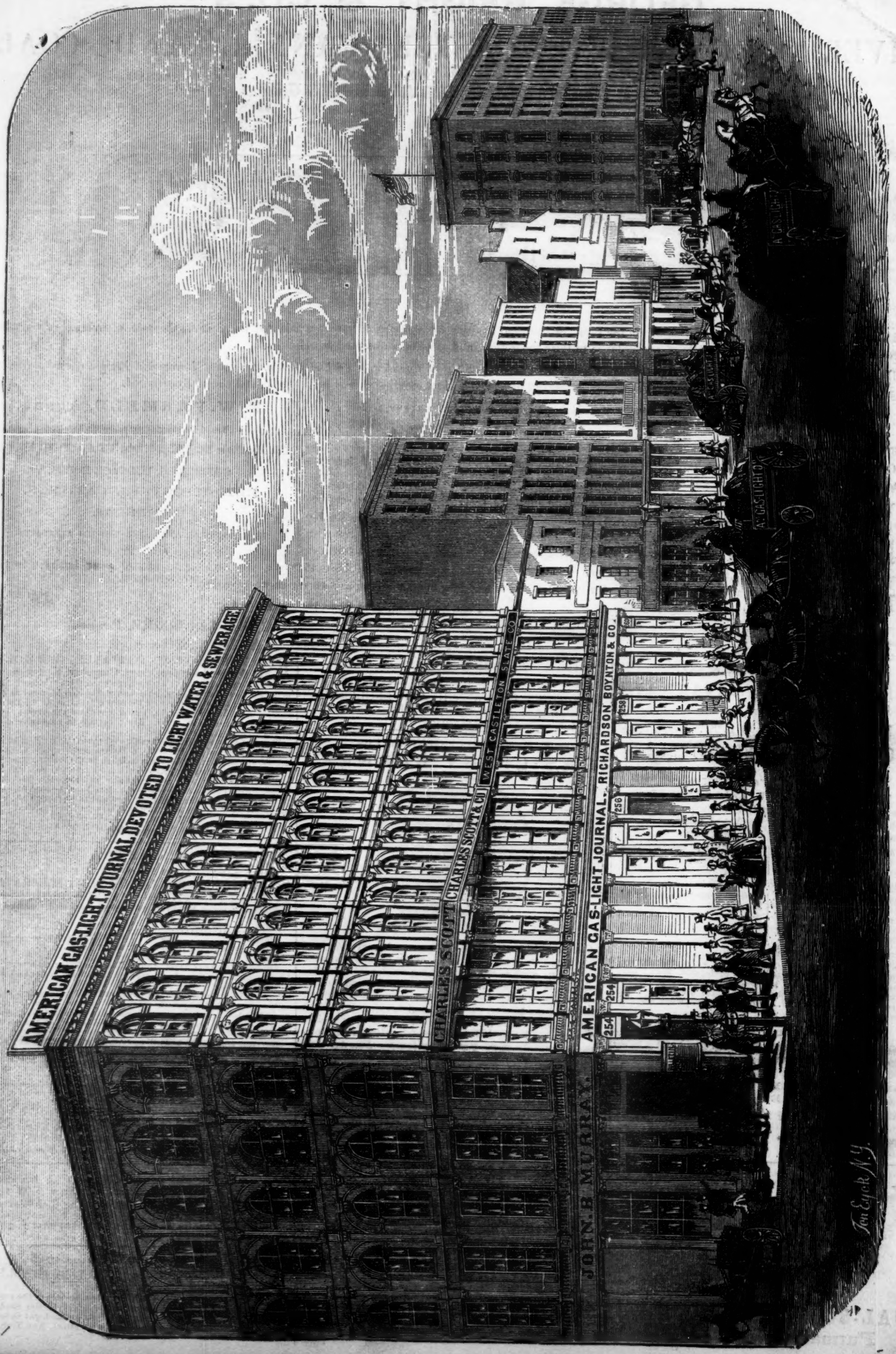
McKINNY & KELLY,

MANUFACTURERS OF

COAL-SCOOPS AND COKE-BARROWS FOR GAS-WORKS,

Furman Street near Fulton Ferry, Brooklyn, N. Y.



NEW ROOMS OF THE AMERICAN GAS-LIGHT JOURNAL ;—LOOKING TOWARDS BROADWAY.—[See Page 160.]